NAVAL
POSTGRADUATE
SCHOOL

MONTEREY, CALIFORNIA

MBA PROFESSIONAL REPORT

TRUTH IN NEGOTIATIONS ACT: GETTING THE INCENTIVES RIGHT

December 2014

By: **Crystal Champion,**
Meredith Ellen, and
Jenny Walk

Advisors: **Chong Wang**
Rene G. Rendon

Approved for public release; distribution is unlimited

THIS PAGE INTENTIONALLY LEFT BLANK

1. AGENCY USE ONLY *(Leave blank)*	2. REPORT DATE December 2014	3. REPORT TYPE AND DATES COVERED MBA Professional Report

4. TITLE AND SUBTITLE TRUTH IN NEGOTIATIONS ACT: GETTING THE INCENTIVES RIGHT	5. FUNDING NUMBERS
6. AUTHOR(S) Crystal Champion, Meredith Ellen, Jenny Walk	

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Postgraduate School Monterey, CA 93943–5000	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING /MONITORING AGENCY NAME(S) AND ADDRESS(ES) N/A	10. SPONSORING/MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government. IRB Protocol number _____N/A_____ .

12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release; distribution is unlimited	12b. DISTRIBUTION CODE

13. ABSTRACT (maximum 200 words)

The Truth In Negotiations Act (TINA) is a contracting statute that has been put into place in order to protect the Department of Defense's funds by mandating that contractors provide certified cost or pricing data. When cost estimates exceed the TINA threshold ($700,000), and when all other means of negotiating fair and reasonable pricing are not available, TINA ensures that a fair and reasonable price can be determined from the contractor submitted data. Despite its good intentions, TINA remains controversial. Supporters of TINA argue that certified cost or pricing data protects the government's funding: if a later audit shows pricing deviations, the U.S. government can charge contractors penalties and recoup funds if necessary. Critics of TINA, however, argue that TINA does not provide the right incentives to contractors to induce their best efforts. In fact, with certain types of contracts on the contract type spectrum, the contractor and the government both may benefit if TINA provisions are modified to allow for flexibility with certified cost or pricing data. This study proposes to evaluate TINA from an economic view, with a contracting emphasis on investigating incentives that are generated under TINA.

14. SUBJECT TERMS Truth in Negotiations Act, TINA, DCAA, Fixed-Price, Cost-Reimbursement, Incentives, trends, Policy, Contracting, Defense Contractors, acquisition initiatives	15. NUMBER OF PAGES 81
	16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT UU

THIS PAGE INTENTIONALLY LEFT BLANK

TRUTH IN NEGOTIATIONS ACT: GETTING THE INCENTIVES RIGHT

Crystal Champion, 1st Lieutenant, United States Air Force
Meredith Ellen, Captain, United States Air Force
Jenny Walk, Captain, United States Air Force

Submitted in partial fulfillment of the requirements for the degree of

MASTER OF BUSINESS ADMINISTRATION

from the

NAVAL POSTGRADUATE SCHOOL
December 2014

Authors:	Crystal Champion
	Meredith Ellen
	Jenny Walk
Approved by:	Chong Wang, Lead Advisor
	Rene G. Rendon, Co-Advisor
	William R. Gates, Dean
Graduate School of Business and Public Policy

THIS PAGE INTENTIONALLY LEFT BLANK

TRUTH IN NEGOTIATIONS ACT:
GETTING THE INCENTIVES RIGHT

ABSTRACT

The Truth In Negotiations Act (TINA) is a contracting statute that has been put into place in order to protect the Department of Defense's funds by mandating that contractors provide certified cost or pricing data. When cost estimates exceed the TINA threshold ($700,000), and when all other means of negotiating fair and reasonable pricing are not available, TINA ensures that a fair and reasonable price can be determined from the contractor submitted data. Despite its good intentions, TINA remains controversial. Supporters of TINA argue that certified cost or pricing data protects the government's funding: if a later audit shows pricing deviations, the U.S. government can charge contractors penalties and recoup funds if necessary. Critics of TINA, however, argue that TINA does not provide the right incentives to contractors to induce their best efforts. In fact, with certain types of contracts on the contract type spectrum, the contractor and the government both may benefit if TINA provisions are modified to allow for flexibility with certified cost or pricing data. This study proposes to evaluate TINA from an economic view, with a contracting emphasis on investigating incentives that are generated under TINA.

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

LIST OF FIGURES

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF TABLES

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF ACRONYMS AND ABBREVIATIONS

CAM	Contract Audit Manual
COR	Contracting Officer Representative
CPARS	Contractor Performance Assessment Reporting System
CPAF	Cost-Plus-Award-Fee
CPIF	Cost-Plus-Incentive-Fee
CPFF	Cost-Plus Fixed-Fee
DCAA	Defense Contract Audit Agency
DCMA	Defense Contract Management Agency
DOD	Department of Defense
HCA	Head Contract Agency
FFP	firm fixed price
FOUO	for official use only
FPI	Fixed-Price-Incentive
PPIRS	Past performance information retrieval system
RFI	request for information
SPO	Systems Program Office
TINA	Truth in Negotiations Act
QAE	Quality Assurance Evaluator

THIS PAGE INTENTIONALLY LEFT BLANK

ACKNOWLEDGEMENTS

We would like to thank our advisors, Professor Chong Wang and Professor Rene G. Rendon, for all of their assistance, support, guidance, and the time that they spent with us in order to make this MBA Project a success. We have learned so much from each of you, and it has been an honor to work with you both on this project.

THIS PAGE INTENTIONALLY LEFT BLANK

I.   INTRODUCTION

A.   BACKGROUND

Prior to the 1960s, the government was not considered to be on an even footing with the government contactor when negotiating contract prices (Murdock, 2012, slide 5). Non-commercial item pricing was considered complete in good faith of the offerors and guidance regarding fair and reasonable pricing was left to the Contracting Officer's judgment. When the Truth in Negotiation Act (TINA), Public Law 87–653 was passed, it seemed that the DOD would be heading in the right direction (Murdock, 2012, slide 5). Not only would cost or pricing data be required for noncommercial items, but also contractors found to be providing incomplete data would be liable for remedy. Additionally, the burden of proof would solely be the contractor's responsibility should a defective pricing case be filed. It seemed that the ultimate goal had finally been attained: that Contracting Officers would be guaranteed access to cost or pricing data to negotiate fair and reasonable prices, and contractors would be putting forward their best effort to maintain those prices.

Despite its good intention and more than a half-century in practice, TINA remains a controversial issue. Advocates of TINA would argue that TINA effectively reduces contractors' incentives for engaging in "defective pricing" practices. Opponents, on the other hand, point to the extra cost burden and other unintended negative consequences. This lack of consensus indicates that a comprehensive assessment of TINA's weaknesses and strengths is necessary. This study will evaluate TINA from an economic perspective, with emphasis on investigation of contractor incentives. To measure incentive effectiveness, contract benefits and costs will be analyzed in a series of contract scenarios. Based on these findings, recommendations will be made.

B.   PURPOSE OF RESEARCH

The main purpose of this research is to raise and address a major issue in the current policy of TINA. That is, concerning the potential litigation risk imposed by TINA, contractors lack incentives to exert their best effort. Such sub-optimal efforts

introduce inefficiencies that are ultimately borne by taxpayers for each contract as it pertains to profit and applicable costs to the government. In this economic analysis, the pros and cons will be assessed and an implementation of useful policies will be explained in a way forward for the use of TINA. This research is important because it identifies weaknesses of TINA and influence policy recommendations. Significant cost savings could be achieved by providing the right incentives to DOD contractors.

C.   RESEARCH QUESTIONS

The research questions of this thesis are:

1.   Does TINA provide the proper incentives (or disincentives) for DOD contractors to induce their best effort?

2.   How should TINA be used in a dynamic setting?

3.   What incentive-compatible policy implications can be generated from this scenario based analyses and economic research?

D.   BENEFITS OF RESEARCH

The beneficiaries of this research include: the Defense Procurement and Acquisition Policy (DPAP), the government contracting units, DOD contractors, and the United States taxpayers. This research seeks to provide better incentive solutions to induce contractors' best effort while also generate cost savings to the government. In return, designing a better incentive system will foster stronger DOD-Contractor relationships, and hence form a more streamlined and efficient process.

E.   METHODOLOGY

A thorough review, on relevant academic literature and institutional knowledge of TINA, is first provided to set the stage for further analysis. Then we employ an economic-based, incentive-centric study that focuses on investigation of various incentives generated by TINA. We perform analyses for various contracting settings.

F.   ORGANIZATION OF THESIS

Our research is organized into six chapters.

Chapter I details the background, the purpose, and research questions of this thesis. We also discuss beneficiaries; methodology and organization flow in this chapter. Chapter II provides a detailed description of TINA that includes its historical evolution, as well as the current implementation. This chapter also discusses exceptions to certified cost and pricing data. Chapter III reviews academic literature that is relevant to our research. This literature review discusses the issues with agency theory, moral hazard and adverse selection problems in the defense procurement system. The purpose of Chapter IV is to document TINA's past success. We introduce compliance issues with TINA and provide data from the Defense Contract Audit Agency with TINA audits from 2008-present. This chapter also discusses how the use of TINA reduces information rents. Chapter V describes how TINA fails to address the "Moral Hazard" problem with Fixed-Price Contracts, Cost-Plus Contracts, and also incentive based contracts. It includes a numerical example with reasonable assumptions to show how correcting contractors' misaligned incentives can generate the cost-savings to the government. This chapter also addresses some other unintended negative consequences that are attributable to TINA. The final chapter summarizes the research that was performed for this report and gives the major conclusions. It also suggests areas for further research.

THIS PAGE INTENTIONALLY LEFT BLANK

II.   TINA INSTITUTIONAL KNOWLEDGE

A.   INTRODUCTION

One of the obligations of a contracting officer is to negotiate fair and reasonable pricing on any service or product that he or she purchases on behalf of the Government. There are four approaches that a contracting officer can take in order to ensure that fair and reasonable pricing is met. The four fair and reasonable pricing approaches include adequate price comparisons, commercial prices, prices that have already been set by laws and/or regulations, and obtaining certified cost and pricing data (via TINA). (FAR 15.403, 2014). Being able to obtain fair and reasonable pricing based on any of these four approaches allows the DOD to protect the taxpayer's dollar and ensure that we are receiving a fair and reasonable price. TINA allows the contracting officer to negotiate fair and reasonable prices with the contractor when prices aren't available by the other three approaches. Being able to obtain certified cost and pricing data is crucial to the success of the acquisition because it not only allows negotiations of fair and reasonable pricing, but it also provides a blanket of protection for the U.S. government as well. Another benefit of receiving certified cost and pricing data is that at the completion of the acquisition, the Defense Contract Audit Agency can audit the contractors' actual prices and determine if defective pricing exists.

The Truth In Negotiations Act (TINA) was created in 1962 to protect the U.S. government from overpaying the contractor due to the lack of supporting cost and pricing data (Williams, 1970, p. 3). When the cost of a product or service reaches over the current TINA dollar threshold and comparative pricing is not available, contractors are required, under TINA, to provide certified cost and pricing data (Williams, 1970, p. 4). This pricing data provides the government a basis to determine a fair and reasonable price. Without the TINA statute, certified cost and pricing data would not be available to the contracting officer, which could make it difficult for the contracting officer to determine whether costs are fair and reasonable.

To understand how TINA works, it is important to understand what certified cost and pricing data is and how contractors obtain this information. The Federal Acquisition Regulations (FAR) defines *certified cost and pricing data* as

> Certified cost or pricing data" means "cost or pricing data" that were required to be submitted in accordance with FAR 15.403–4 and 15.403–5 and have been certified, or are required to be certified, in accordance with 15.406–2. This certification states that, to the best of the person's knowledge and belief, the cost or pricing data are accurate, complete, and current as of a date certain before contract award. Cost or pricing data are required to be certified in certain procurements (10 U.S.C. 2306a and 41 U.S.C. chapter 35). (FAR 2.101, 2014)

The use of TINA creates an accountability check for both the DOD as well as the contractors in order to prevent defective pricing. The remainder of this chapter will include a historical review of TINA, the enactment and policy implementation of TINA, and also exceptions to certified cost and pricing data.

B. TINA DEFINED

The Truth in Negotiations Act (TINA) is a statute that has been put into place in order to protect the U.S. government from obtaining inflated pricing. TINA comes into effect when the government has a purchase for a product or service estimated to cost over the current TINA threshold and no other pricing information is available. When a contractor submits a proposal, they need to provide certified cost and pricing with their proposal, which protects the government from the contractor over-inflating their price and the government paying too much for a product or service. Since the Government has no other pricing information, it is difficult for the contracting officer to determine what price is reasonable for the product or service being procured. With TINA, the U.S. government is provided with certified cost and pricing data from the contractor, which provides a blanket of protection from the government overpaying for the procured product or service. What exactly does TINA do to protect the U.S. government?

Prior to negotiations, the contractor submits cost and pricing data that has yet to be certified. Once negotiations have been completed, and both parties have agreed on price, this is when the contractor provides certified cost and pricing data for submitting to

the contracting officer. It isn't until the procurement is completed or near completion that DCAA can perform an audit of the contractors' certified cost and pricing data in comparison with their actual costs. Once the audit is complete, the government can recoup costs if DCAA identifies a defective pricing situation, due to defective cost and pricing data (Rene G. Rendon, personal communication, 10 November 2014).

PGI 215.402(1) provides the Pricing Policy and provides the guidelines for the Truth in Negotiations Act.

> (1) Contracting officers must purchase supplies and services from responsible sources at fair and reasonable prices. The Truth in Negotiations Act (TINA) (10 U.S.C. 2306a and 41 U.S.C. chapter 35) requires offerors to submit certified cost or pricing data if a procurement exceeds the TINA threshold and none of the exceptions to certified cost or pricing data requirements applies. Under TINA, the contracting officer obtains accurate, complete, and current data from offerors to establish a fair and reasonable price (see FAR 15.403). TINA also allows for a price adjustment remedy if it is later found that a contractor did not provide accurate, complete, and current data. (PGI 215.402(1), 2014)

Like the name states, the Truth In Negotiations Act "… significantly levels the playing field regarding superior knowledge regarding cost and pricing data…" (Public Contracting Institute, 2014, p. 1). Since the contracting officer is not expected to be the subject matter expert on the costs of the procured product or service, the contractor providing certified cost and pricing data to the contracting officer allows both the contracting officer and contractor to be on the same level in regards to knowing what a fair and reasonable price is for the procured item or service. Without the TINA statute in effect, the contractor could come into negotiations with all of the vital pricing information and induce the government to unknowingly enter into a contract at a highly unreasonable price.

One of the main responsibilities of a contracting officer is to ensure that the taxpayer's money is being utilized in the most effective way possible, and this is accomplished with the ability to obtain fair and reasonable pricing to ensure quality products and services at a reasonable price. TINA is put into effect in order to protect the taxpayers' dollar. A fair and reasonable price doesn't necessarily mean that it's the lowest

negotiated price. If a contractor submits a proposal that is significantly below the competitor's bid this should raise concern to the contracting officer. The low proposal could mean that a contractor is low-balling their proposal or that they don't necessarily understand the full requirement. On the other hand, a proposal that is too high is cause for concern as well. "In determining fair and reasonable prices, the contracting officer is concerned with price realism (cost is too low) and price competitiveness (price is too high)" (Rene G. Rendon, personal communication, 01 December 2014).

C.   ENACTMENT AND POLICY IMPLEMENTATION OF TINA

Congress enacted TINA into law in 1962. The enactment came about due to the GAO findings in 1959 that the government was overpaying contractors for their products or services (2013 Contract Attorneys Desktop, pp.12–12, 12–13). "Between 1957 and 1962 the GAO discovered overcharges amounting to $61 million[1] resulting from the contractors' failure to provide government negotiators with complete, accurate and current cost and pricing data[2]" (Williams, 1970, p. 1). There was a serious issue with the government overpaying and it needed to be resolved immediately. "The importance of this problem was reflected in prompt congressional hearings to thoroughly examine the problem[3] and the revision by the Department of Defense (DOD) of its cost certification procedures" (Williams, 1970, p. 1–2).

As a result, it was determined that certified cost and pricing data was needed to be made mandatory and enacted into law. When this law became enacted, it required certified cost and pricing data on all contracts that surpassed the amount of $100,000 (Di Guiseppe, 2011, p. 3). Years later, this threshold was increased to $650,000 first and then to the current amount of $700,000 (Maddox, 2013, p. 26).

---

[1] Hearings on Relation of Cost Data to Military Procurement Before the Subcomm. For Special Investigation of the House Comm. On Armed Services, 88th Cong., 1st Sess. at 6 (1963).

[2] Id. According to one knowledgeable official: The buyer's lack of knowledge…of the latest cost data available to the vendor in establishing prices is the most important weakness observed in the vendor in establishing prices is the most important weakness observed in the cases (of overpricing). This has resulted in excessive prices being paid by the government.

[3] E.g., Hearings Before the Procurement Subcomm. of the Senate Comm. on Armed Services, 86th Cong., 2d Sess., pt. 2, at 146 (1960).

D.   EXCEPTIONS TO CERTIFIED COST AND PRICING DATA

As mentioned previously in this chapter, there are four approaches the Government has to ensure a fair and reasonable price. The four fair and reasonable pricing approaches include adequate price competition, commercial prices, prices that have already been set by laws and/or regulations, and obtaining certified cost and pricing data (via TINA). (FAR 15.403, 2014, p. 1).

Out of the four approaches, having adequate price competition is the best way to receive a fair and reasonable price. If this approach is not available next best would be to buy commercial. The third best approach is to obtain fair and reasonable pricing based on prices that are set by laws and regulations. When none of the three approaches to receiving fair and reasonable pricing are available, then TINA requires contractors to submit certified cost and pricing data to ensure prices that are fair and reasonable. TINA is not the most preferred method, but it does allow for the contracting officer to obtain fair and reasonable pricing in order to support public policy. (Rene G. Rendon, personal communication, 26 November 2014).

Based on the above discussion, one of the approaches to negotiating fair and reasonable prices is to obtain certified cost and pricing data (TINA). (FAR 15.4, 2014, p.1). However, the FAR identifies exceptions to requiring certified cost and pricing data. These exceptions include:

> (1) When the contracting officer determines that prices agreed upon are based on adequate price competition (see standards in paragraph (c)(1) of this subsection);
>
> (2) When the contracting officer determines that prices agreed upon are based on prices set by law or regulation (see standards in paragraph (c)(2) of this subsection);
>
> (3) When a commercial item is being acquired (see standards in paragraph (c)(3) of this subsection);
>
> (4) When a waiver has been granted (see standards in paragraph (c)(4) of this subsection); or

(5) When modifying a contract or subcontract for commercial items (see standards in paragraph (c)(3) of this subsection). (FAR 15.403-1(b)(1)-(5), 2014).

Although a TINA waiver can be acquired, this is not the most suitable method due to the fact that even though TINA is not the most preferred method of receiving fair and reasonable pricing, it is the Contracting Officer's last resort for ensuring fair and reasonable prices. (Rene G. Rendon, personal communication, 26 November 2014).

E.   SUMMARY

This chapter provided an overview on the Truth In Negotiations Act, a definition, how it is implemented in the Department of Defense, as well as the exceptions to certified cost and pricing data. It outlined the purpose for this statute and why it is important to apply TINA accordingly, in order to ensure that the Government funding is protected and to help in preventing defective pricing against the government. TINA is an important statute that is adaptable to the changing times with modification made to the threshold price increasing over the years.

III. LITERATURE REVIEW

A. INTRODUCTION

This chapter reviews academic literature that is relevant to DOD acquisition, and sets foundation for the subsequent analyses. Agency theory and the contract management process will be discussed as an overview for many of the topics included in this chapter. Delving more into the literature, a general description of the unique characteristics that underlie DOD major weapon system acquisitions will be introduced, and then this chapter will discuss adverse selection and moral hazard concepts. Further, elaboration on why DOD contracting is subject to both adverse selection and moral hazard problems, and consequently, limiting information rents and inducing the best effort naturally become the two objectives for the policy makers will be discussed. Also, this chapter will introduce the concept of "power of incentive schemes" and how this concept applies to various contract types. Finally, non-commitment and ratchet effect in DOD contracting is discussed, along with a brief introduction to the cost padding behavior of DOD contractors.

B. AGENCY THEORY AND THE CONTRACT MANAGEMENT PROCESS

1. Agency Theory

Agency theory reflects the relationship between the government (principal) and contractors (agency). This relationship is shown as a contract. As discussed by Dr. Rene G. Rendon,

> The principal (government) contracts with the agent (contractor) to perform a level of effort, such as developing or manufacturing a product or providing service. In this relationship, the government's objectives include obtaining the product or service at the right quality, right quantity, right source, right time, and right price...Contractors, on the other hand, pursue the objectives of earning profit, insuring company growth, maintaining or increasing market share, and improving cash flow... (Rendon, 2011, p. 5)

In addition to conflicting objectives, there is information asymmetry between both parties. The contractor knows more about the capabilities and cost data while the government knows more about the mission and the requirement.

The conflicting objectives and information asymmetry between the government and contractor result in both parties demonstrating specific behavior during the contracting process. The government seeks additional information on the contractor, for example, information related to contractor's capability, cost and pricing data, and performance during the contract period. The contractor seeks to take advantage of its superior level of information by hiding information and perhaps hiding effort or lack of effort during the contract performance period. This behavior is reflected in the contract management process, which will be discussed next.

Figure 1 describes the relationship between the government and the contractor as well as the principal-agent problem.
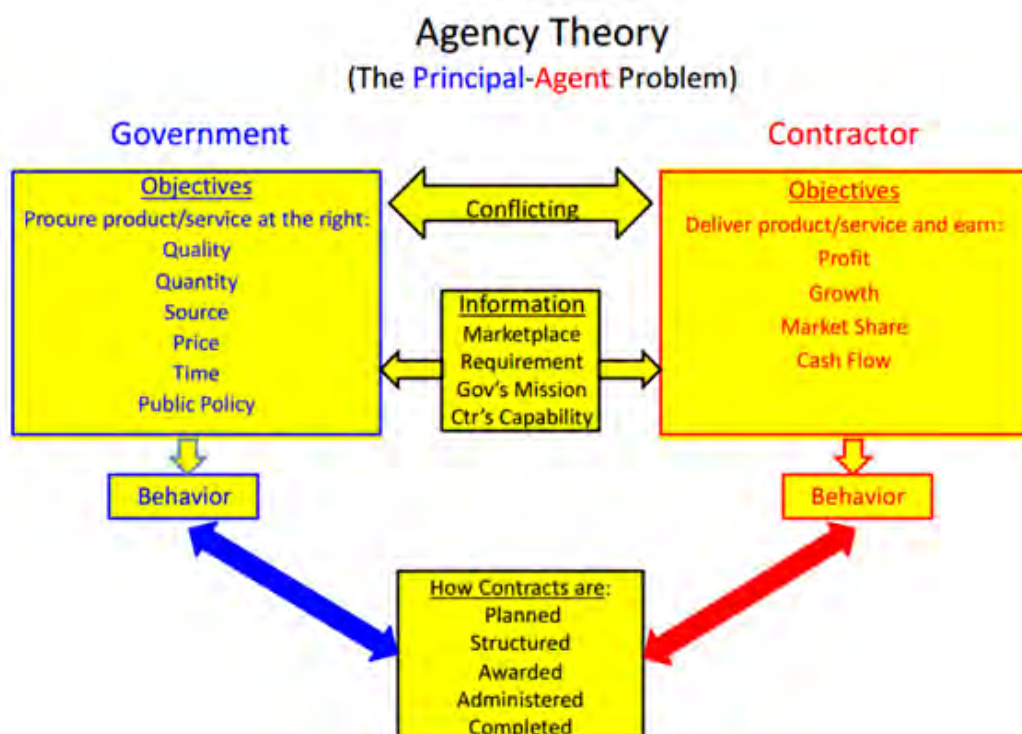
Figure 1.   Agency Theory (from Rendon, 2011, p. 6)

The figure shows the conflicting goals between government and contractors. Agency theory describes this conflict as the government and contractor being asymmetric. As shown above in Figure 1, both parties withhold or share information due to the conflicting goals of their individual objectives. Their behavior for each objective depicts how the contract management process will be executed. The contract management process is designed to counter agency theory.

2.   Contract Management Process

As stated, the contract management process is designed to mitigate the adverse effects of agency theory through acquisition policy and process. For acquisitions personnel, there are six key steps to follow when managing requirements and contracts (Rendon, 2011, p. 6). Each step is the governments counter to agency theory issues, which will be discussed throughout this chapter, as well as the entire contract management process.

1. Procurement Planning: the process of knowing what, how, and when to procure. This step provides timely completion of market research and conducting requirement definition to gain knowledge and information from potential offerors. A request for information (RFI) is used quite often during this phase to combat any gray areas or lack of knowledge on a requirement. Requirements personnel will define the product or service and estimate costs of obtaining them. With the requirement information, a contract type may be chosen that falls on either the cost reimbursement spectrum or the fixed price spectrum (refer to Figure 2).

2. Solicitation Planning: the process for preparing documents for a solicitation. Solicitation planning is where the type of contract vehicle that will be used is determined and where the government defines the terms and conditions of a contract which can allow cost and pricing information to be collected from potential offerors. The basis of the requirement will be provided to prospective bidders to offer proposals.

3. Solicitation: the process of attaining proposals from perspective contractors.

13

4. Source Selection: the process of attaining proposals and applying the proposal to the evaluation criteria. Data on past performance and reviews of the proposals including negotiating a price is also completed within the source selection phase. Once the contract process reaches source selection and offeror data is negotiated, cost or pricing data must be certifiable in order to determine price fair and reasonableness prior to acceptance. Requiring certifiable data mitigates the risk of contractor-hidden information because throughout the life of the contract, certified data must be updated to avoid the legal consequences of TINA. In major defense acquisition systems, certifiable data and negotiated cost estimations are imperative to mitigating cost overruns. If the government does not receive all information or the contractor does not provide their best level of effort to mitigate cost overruns, then adverse selection and moral hazards may be present.

5. Contract Administration: the process of maintaining, monitoring, and surveying the contract and ensuring all requirements are met.

6. Contract Closeout: the process of verifying that the contract is complete and all requirements are met in accordance with the contractual agreement. This includes the audit of actual cost verses estimated cost, final acceptance of deliveries as well as final payment. Although each step in the acquisition process is needed to ensure successful contract execution, important steps pertaining to TINA include procurement planning, source selection, and contract closeout. Because major defense systems procurement is large and unique, the complexities associated with information asymmetry strengthens reasoning to the vital importance of contractor surveillance and TINA provisions in determining fair and reasonable prices. Adverse selection and moral hazard will aid in describing the problems within defense procurement, which will be discussed next.

C. THE ADVERSE SELECTION AND MORAL HAZARD PROBLEM IN DEFENSE PROCUREMENT

1. Unique Characteristics of Major Weapon System Acquisitions

Major Defense Acquisition Programs (MDAP) are unique and complex in nature. Wang and San Miguel argue that, "MDAP contracting environment is unique in the sense

that an MDAP contract is typically a sole-buyer-and-sole-seller case, in which market competitive forces rarely exist and significant information asymmetry and potential agency problems prevail" (Wang & San Miguel, 2013, p. 6). The major contributing factor to the "sole source" or "near sole source" contracting scenario is "the complexity, uncertainty, and long-term commitment in major weapon systems" Other reasons are "the DOD's need for secrecy, expediency, and/or safeguarding human resources" (p. 6).

The "sole-source" scenario puts the DOD at an informational disadvantageous position relative to the contractor in the contracting process. Due to the significant information gap between the contractor and the government, the contractor has intent and ability to extract information rents from the government. Information rent means, the agent (contractor) has more information than the principal (government) and is not providing that information to the principal, in terms of information and effort. Moreover, since the effort level of the only capable contractor is not observable, contractors' shirking becomes a legitimate concern. Agency Theory is related to information rents, as there is a higher risk in developing MDAP with higher levels of uncertainty. (Rendon, 2011)

In reality, DOD has a policy for monitoring and surveying the contractor. There are policies set up for individuals to monitor performance such as Quality Assurance Evaluators (QAE), Contracting Officer Representatives (COR), and the Defense Contracting Management Agency (DCMA). DCMA is the agency that provides contract administration for many high dollar contracts with performance being an item that is evaluated. With an entire agency being accountable for the contractor surveillance, it would seem that there would not be any issue in providing the appropriate materials and information from contractors. In addition to information rents, adverse selection and moral hazard, which will be expounded upon later, further explain the concepts related to the lack of information and effort from contractors.

2.   Adverse Selection and Moral Hazard

The adverse selection (i.e., contractor has hidden information) problem arises when contractors have information withheld from the government. Many times, the

government needs assistance with determining how much a product or a new system should cost. Through the procurement planning phase (market research and the requirement management process) the government gains a better grasp on the companies that provide quotes and is able to negotiate better prices for the requirement.

Laffont and Tirole (1993) provide a footnote from Robert Keller, who was the former assistant comptroller general of the United States in regards to adverse selection, stating:

> The government negotiator generally is at a disadvantage in trying to negotiate, since the contractor knows not only all the facts and the assumptions underlying his estimates, the alternatives available to him, and the contingent areas, but he also knows the price at which he will be willing to accept the contract. (p. 2)

While Keller's statement is correct, DOD attempts to subsume the affects of adverse selection by conducting market research and necessitating the customer define the requirement for each contract.

While adverse selection is impactful on obtaining key information, moral hazard, another issue related to obfuscated details, describes the withholding of data related to contractor effort. Laffont and Tirole (1993) define moral hazard (i.e., contractor has a hidden effort) as, "endogenous variables that are not observed by the regulator. The firm takes discretionary actions that affect its cost or the quality of its products. The generic label for such discretionary actions is effort" (p. 1). Effort is hard to observe and hence cannot be contracted as a unit of measure. As a whole, society is lazy and hence contractors tend to shirk unless incentives are provided to induce more effort. With moral hazard, the information provided by the contractors on their past performance and quality of work can be manipulated to make it seem as though the company is making their best effort, and some very well might be, but in reality, the contractors are shirking.

In reality, DOD has systems in place that collect contractor past performance information, both positive and negative, and this information is used in contract source selections. Contractor Performance Assessment Reporting System (CPARS) and Past

Performance Information Retrieval System (PPIRS) are both automated systems that are web-based that aid the government in the contracting process.

In general, DOD contracts are subject to both adverse selection and the moral hazard problem, given that significant information asymmetry is the norm and the effort level of contractors are generally not observable, despite the government's policy and requirement for contractor surveillance. Hence, a benevolent government that aims to maximize the whole society's welfare has two policy objectives in mind: limiting undue information rents and inducing cost-saving effort. The issues outlined above are impactful across the contract types, yet while pervasive in nature, the extent and specific influence of moral hazard and adverse selection varies between fixed price, cost-reimbursement, and incentive type contracts. These types of contracts will be discussed next.

D.   VARIOUS CONTRACT TYPES AND POWER INCENTIVE SCHEMES

1.   Fixed Price, Cost-Reimbursement, and Incentive Contracts

There are two major categories of contracts: fixed-price and cost-reimbursement contracts. The two polar cases are firm-fixed price (FFP) and cost-plus fixed-fee contracts (CPFF).

According to FAR 16.202–1:

> A firm-fixed-price contract provides for a price that is not subject to any adjustment on the basis of the contractor's cost experience in performing the contract. This contract type places upon the contractor maximum risk and full responsibility for all costs and resulting profit or loss. It provides maximum incentive for the contractor to control costs and perform effectively and imposes a minimum administrative burden upon the contracting parties.

FAR 16.306 states:

> A cost-plus-fixed-fee contract is a cost-reimbursement contract that provides for payment to the contractor of a negotiated fee that is fixed at the inception of the contract. The fixed fee does not vary with actual cost, but may be adjusted as a result of changes in the work to be performed

under the contract. This contract type permits contracting for efforts that might otherwise present too great a risk to contractors, but it provides the contractor only a minimum incentive to control costs.

Contract type must be determined by associated risk, requirement complexity, and solutions available within the marketplace. On the contract type spectrum, the extreme left where broad requirements accompany a high level of government risk, is purely cost-reimbursement contracts. Firmly defined requirements where the contractor assumes the highest level of risk is on the right of the spectrum, which include fixed price contracts. Figure 2 illustrates the relationship between contract type, requirement, and risk
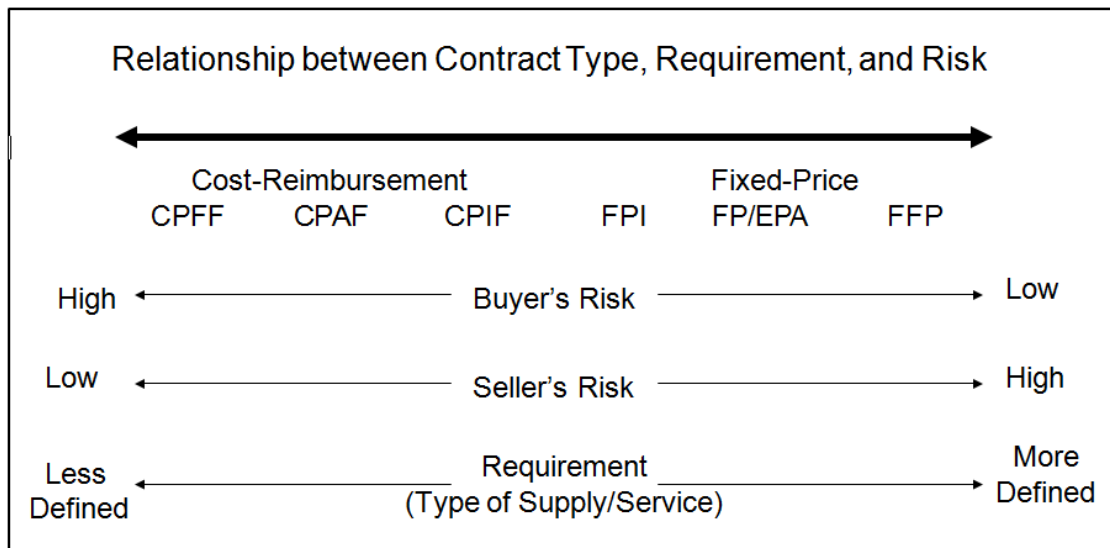
Figure 2.   Relationship between Contract Type, Requirement, and Risk
(from Rendon & Snider, 2008).

As shown above, more risk for the buyer (government) results from the use of cost-reimbursement type contracts. DOD uses cost-reimbursement contracts for requirements such as prototypes due to the less defined requirement. For fixed-price type contracts, the government has low risk because the requirement has already been defined and DOD knows what to expect from contractors with a full understanding of the supply or service being purchased.

An FFP contract addresses the moral hazard problem but still suffers from adverse selection. In this type of contract, the contractor is motivated to exert the best effort to save on cost and maximize profit. Adverse selection on the other hand is still a major problem due to contractors' strong incentive to withhold their proprietary information as well as extract information rents. Even with market research completed by contracting officers, the adverse selection problem remains a significant issue.

A CPFF contract, in contrast, addresses the adverse selection problem better because the reimbursement is based on incurred rather than estimated cost. However, moral hazard becomes the main worry since contractors have no incentive to curb costs. The lack of incentive to minimize cost is due to the fact that contractor's fee is fixed and any cost saving will be passed on to the government as opposed to the contractor. All cost incentives by the contractor will be reimbursed, assuming that they are allowable, allocable, and reasonable.

TINA provisions bear high importance through defense acquisition phases, as it allows the government to obtain certified cost or pricing data which may not have been available had commercial purchases or competed purchases been made. It is important for the government to have not only their own reliable cost estimates, but to also have a basis for evaluating contractors' proposed estimates as well. Additionally, risk of cost overruns is reduced if cost reimbursement and fixed price contracts are used for suggested requirements on the contract vehicle spectrum outlined in Figure 2.

In addition to the FFP and CPFF, there are various incentive contracts that lie between the two extreme cases. They are: Fixed-Price-Incentive (FPI) Contracts, Cost-Plus-Incentive-Fee (CPIF) Contracts, and Cost-Plus-Award-Fee (CPAF) Contracts. These incentive contracts are intermediate contracting arrangements between the two polar types and they typically address both adverse selection and moral hazard, yet neither is effective enough. With each contract type, there is an amount of motivation that empowers contractors to perform. The empowerment for motivation is based on an incentive scheme, which is discussed next.

2. Power of Incentive Schemes

The various types of contracts discussed possess different power of incentive schemes. Power, in relation to incentive schemes, means the extent to which the scheme can motivate effort. Table 1 is reproduced from Laffont and Tirole (1993).

	Transfer Allowed?	
Power	Yes (procurement, most public enterprises)	No (most private regulated firms)
Very High (firm residual claimant)	Fixed price contracts	Price caps
Intermediate (cost or profit sharing)	Incentive contracts	Incentive regulation
Very Low (government or consumers residual claimants)	Cost-plus contracts	Cost-of-service regulation

Table 1.   Power of commonly used incentive schemes
(from Laffont & Tirole, 1993, p. 11)

Laffont and Tirole explain that a cost-reimbursement contract has the government pay the contractor its allowable cost plus a fee while a fixed-price contract has a set limit that the government will pay regardless of what the actual cost incurred. They also explain that the incentive contracts have the government and the contractors share the actual costs.

With a fixed-price contract, contractors are incentivized to put forth the most amount of effort. Although the contractor knows they will receive a fixed price for their product, the more they reduce the cost, the more profit they will realize. Thus, fixed price contracts are high power incentive schemes.

A cost-reimbursement contract gives few incentives to the contractor to exert effort and hence is labeled as low power incentive scheme. Incentive contracts, as

20

intermediate arrangements between fixed-price and cost-reimbursement contracts, are intermediate power incentive schemes. The literature shows that if a contract is fixed-price, the effort is induced 100%. If the contract is cost-reimbursement, the effort is induced at 0%. (Laffont & Tirole, 1993, p. 40) The next section will discuss non-commitment and the ratchet effect.

E. NON-COMMITMENT AND THE RATCHET EFFECT

In DOD contracting, contracts are traditionally awarded for one basic year with priced options for additional years. This is known as multiple year contracting. Another approach is multi-year contracting. Multi-year contracting is described as "a single contract for two to five years' worth of procurement of a given kind of item without having to exercise a contract option for each year after the first" (O'Rourke & Schwartz, 2014, p. 3). To gain a better understanding, Table 2 summarizes the O'Rourke and Schwartz example of the difference between multiple-year contracting and multiyear contracting aircraft.

	Number of Contracts	FY2015	FY2016	FY2017	FY2018	FY2019
Multi-year Procurement	1	1	0	0	0	0
Fund Request	1-Time Authorization	X				
Contract Execution	Approved in FY2015	X				
Aircraft Purchased on Contract	One-time	20	0	0	0	0
Congressional Approval?	Yes					

	Number of Contracts	FY2015	FY2016	FY2017	FY2018	FY2019
Multiple-year Procurement	5	1	1	1	1	1
Fund Request	Annual Authorization	X	X	X	X	X
Contract Execution	Approved Each FY	X	X	X	X	X
Aircraft Purchased on Contract	Annual	4	4	4	4	4
Congressional Approval?	No					

Table 2.   Multi-year vs. Multiple Year (after O'Rourke & Schwartz, 2014, p. 3)

Typically, the contractor would view long-term contracts as a positive incentive for profit. Under multi-year procurement (MYP), if the government cancels a program and subsequently terminates the contract, the government owes the contractor a fee. For

the government, adhering to 10 U.S.C. 2306b(a) criteria is critical to staying on cost. Criteria includes 1) substantial savings, 2) realistic cost estimates, 3) a stable need for the items, and 4) a stable design (O'Rourke & Schwartz, 2014, pp. 5–6). An alternative to MYP is multiple-year contracting. The issue with the ratchet effect is that with short-term contracts, a contractor has little incentive to improve target costs when there is a small window of performance. In cost-based requirements, multiple-year contracts may be used to provide long-term incentives to contractors while providing a reliable contract vehicle for recurring needs. Awarding multiple-year contracts ensure that the short-term contract is guaranteed and option years are written in the contract for long-term commitment. The risk of exercising options is still present, but at a less extent so as to incentivize the contractor to perform well in order to guarantee an additional year. Multiple-year contracts do not require congressional approval or guarantee of funds stability, and can be used for cost reimbursement type contracts and fixed price type contracts. However, contractor performance is paramount to the government exercising options under multiple-year contracts. If the contractor does not think the government will be committed throughout the life of the basic year plus options, information rents may occur. Laffont and Tirole (1993) relate information rents to the ratchet effect:

> If the firm performs well (produces at a low cost) early in the relationship, the regulator infers that the technological parameter is favorable and tries to extract the firm's rents by being more demanding during the regulatory review. The firm has thus an incentive to keep a low profile by not engaging in much cost-reducing activity. To induce the firm to produce at a low cost when efficient, the regulator must offer it a generous reward for good performance. (p. 45)

Stated equivalently, the lack of the commitment from the government naturally leads to contractors' fear of being "ratcheted up" if they reveal their lowest possible cost. The issue with the ratchet effect is that with short-term contracts, a contractor has little incentive to improve target costs when there is such a small window of performance. Being efficient one time would eliminate their future rents. Therefore, unless the profit from one-year contract is sufficiently sizable, contractors would choose not to engage in cost-saving activities as much as they can. The cure to the problem above is straightforward. Laffont and Tirole (1993) state:

To put the ratchet effect in perspective, recall that, if the two parties can commit to a long-term contract at the beginning of their relationship, the regulator optimally commits to use each period the optimal static contract. That is, it is optimal for the regulator to commit not to exploit the information acquired from observing the firm's performance. Commitment is crucial for this outcome because the regulator would want to fully extract the firm's rents from the second period on after the firm reveals its efficiency in the first period. (p. 376)

Another area that will be discussed within agency theory is cost padding.

F.   COST PADDING

Cost padding, if not detected and controlled by the government, adds unnecessary cost to the government. Examples of cost padding include but are not limited to: incurring excessive costs to the government such as leisurely meetings, first class travel, and business lunches. Other examples are shifting overhead costs from commercial business to government contracts and engaging in various bookkeeping tricks to manipulate costs. The government counters contractor cost padding by requiring certain contractors to be audited. Both Defense Contract Management Agency (DCMA) and the Defense Contract Audit Agency (DCAA) provide oversight and audit of contractor operations and cost.

The DCMA has a systemic operational cycle that allows monitoring contractor cost driving contractor performance. In the DCAA Contract Audit Manual (CAM), Chapter 9 discusses Audit of Cost Estimates and Cost Proposals. Cost padding is a factor in labor cost data. It states:

> The auditor should examine, on a selective basis and in cooperation with Government technicians...for the new product. When appropriate, contractor personnel should be interviewed to ascertain probable significant changes in engineering production methods and the effect those changes might have on current cost data. When an evaluation indicates that significant technological changes have occurred since the cost data was accumulated, adjustment of experienced costs is necessary before projecting the experience cost pattern.

The manual further explains the contractors' variances of direct labor cost and illustrates a "guesstimate" is made and then a "padding" is added to protect from any unexplained

cost. Through the book keeping manipulations, resulting "guesstimates" and subsequent "padding," the contractor audit becomes a significant challenge to accurately appraise the extraneous cost. Cost padding is viewed as being more prevalent in cost-reimbursement contracts, though as will be elaborated later, the incentives for cost padding still exist under a fixed-price contract.

G.   SUMMARY

The academic literature covered the agency theory, the contract management process, unique characteristics of DOD major weapon system acquisitions, and the impact of adverse selection and moral hazard concepts on DOD contracting. Power schemes for incentives within various contract types, non-commitment along with the ratchet effect, and cost padding were also discussed. This chapter discussed agency theory issues and also DOD polices that mitigate those issues. The contract management process described contracting activities within DOD aligned to counter agency theory concepts. Adverse selection and moral hazard showed the hidden information and effort that theoretically is produced while the power incentive scheme showed they types of contracts and how they combat those issues. Non-commitment and the ratchet effect identified the differences between multi-year contracting and multiple year contracting and provided examples of each contract. Finally, cost padding showed the behavior of DOD contractors. The following chapter will discuss what TINA does well.

IV.   TINA: WHAT IT DOES WELL

A.   TINA DETERS FRAUD AND DEFECTIVE PRICING

The Truth in Negotiations Act, which is now referred to as 10 USC 2306a, Cost or Pricing Data: Truth in Negotiations (DCAA Representative, personal communication, 04 December 2014) does many things well. The main purpose of the Truth in Negotiations Act is to protect the Government from the contractor submitting inflated cost and pricing data and therefore receiving unwarranted profit. It allows for the contracting officer to receive pricing information on non-commercial items, for which the contracting officer has very limited basis to determine a fair and reasonable price. TINA is a statute put into place to ensure that the contracting officer has necessary information to perform their stewardship role for safeguarding taxpayers' money. By imposing potential financial loss, reputational damage, and sometimes even litigation risk to the contractor, TINA effectively creates a disincentive for the government contractors to engage in fraud and defective pricing practice.

The success of TINA can be partially demonstrated by data from the Defense Contract Audit Agency (DCAA). The DCAA is an agency under the Department of Defense that aids acquisition personnel with contract auditing, cost and price evaluation, and contract administration. The DCAA describes its mission as "… provides audit and financial advisory services to Department of Defense (DOD) and other federal entities responsible for acquisition and contract administration. DCAA operates under the authority, direction, and control of the Under Secretary of Defense (Comptroller)/Chief Financial Officer" (DCAA, n.d.). Additionally, the DCAA performs post award audit for contracts under TINA and oversees defective pricing cases for the Department of Defense.

Between 2008 and 2014, the DCAA documented that there were 114 audits that had been issued that reported an instance of defective pricing (DCAA Representative, personal communication, August 28, 2014). Out of the 114 audits that had been issued, 39 defective pricing cases had been resolved (during the time of the requested data).

(DCAA Representative, personal communication, August 28, 2014) Of these 39 resolved defective pricing cases, the government was able to recoup funds from 32 of these cases. (DCAA Representative, personal communication, August 28, 2014).

This means that merely 18% of defective pricing cases are ruled in the contractor's favor. Additionally, 37 out of the 38 contracts on the report were firm fixed price-type contracts and one was a cost plus fixed fee contract (a cost reimbursement type contract) (DCAA Representative, personal communication, August 28, 2014). This is not a surprise because defective pricing is a major concern in the context of fixed-price contracts as opposed to cost-reimbursement contracts.

Figure 3 illustrates the government savings from the price adjustments made for these 39 defective pricing contracts during 2008–2014. The charts represented in the figures below illustrate not the year of the contract award, but rather the government fiscal year that a settlement was reached. For instance, a 2008 contract may have been audited but did not reach a settlement until 2009. Therefore, this 2008 contract would be represented in 2009 data in the figures below. According to the chart, the government was able to recoup a total amount of $65,242,000.

> The Net Savings to Government is the total net amount of savings (including recovered interest—but not penalties—on overpayments) that the Government achieves from the defective pricing audit. For FFP contracts, savings will consist of the Negotiated Total Price Adjustment less Negotiated Offset Amount plus applicable profit. For CPAF/CPFF contracts, the savings will consist of the fee/profit reduction. For CPIF/FPI contracts, the savings will consist of the fee/profit reduction plus the contractor share of the cost reduction. (DCAA, 2014)

Total Government Savings (2008-2014)
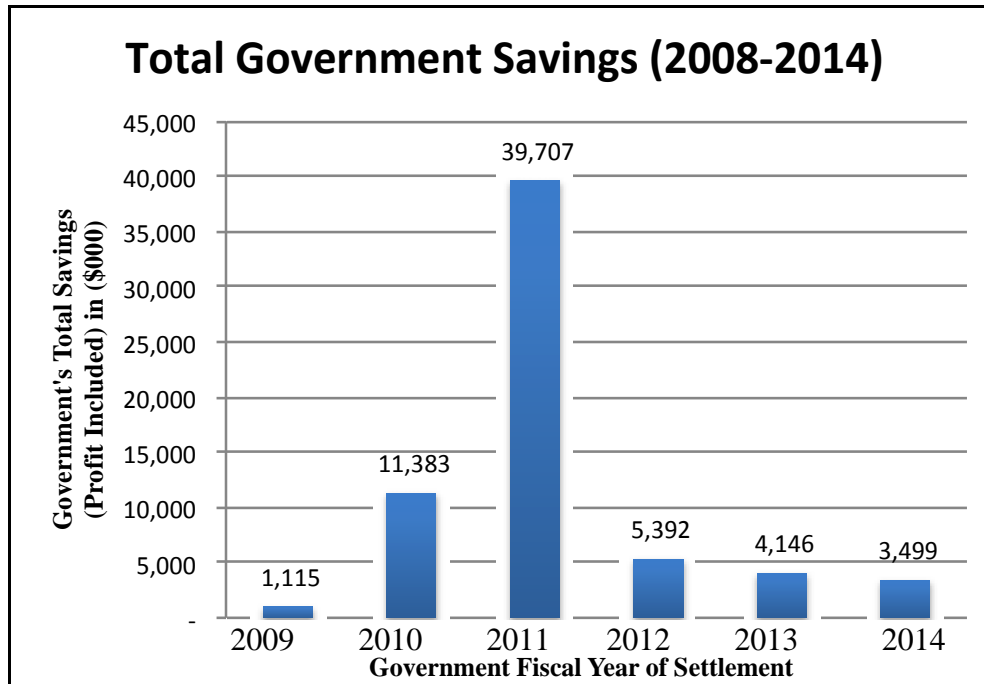
Figure 3.   Total Government Savings (2008–2014) (from DCAA, 2014)

Figures 4–9 display data by individual government fiscal year of the settlement (dollar amounts are represented in $000).

Figure 4 shows that there were three FFP contracts with defective pricing that were settled in 2009, for all of which the contractors fully accepted the price adjustments recommended by the DCAA. This resulted in $1,115,000 direct savings to the Government and provides evidence for the effectiveness of TINA.

	1	2	3
Assigned Contract Value	121,531	-	-
DCAA Rec. Price Adjustment	984	14	57
Negotiated Amount	984	14	57
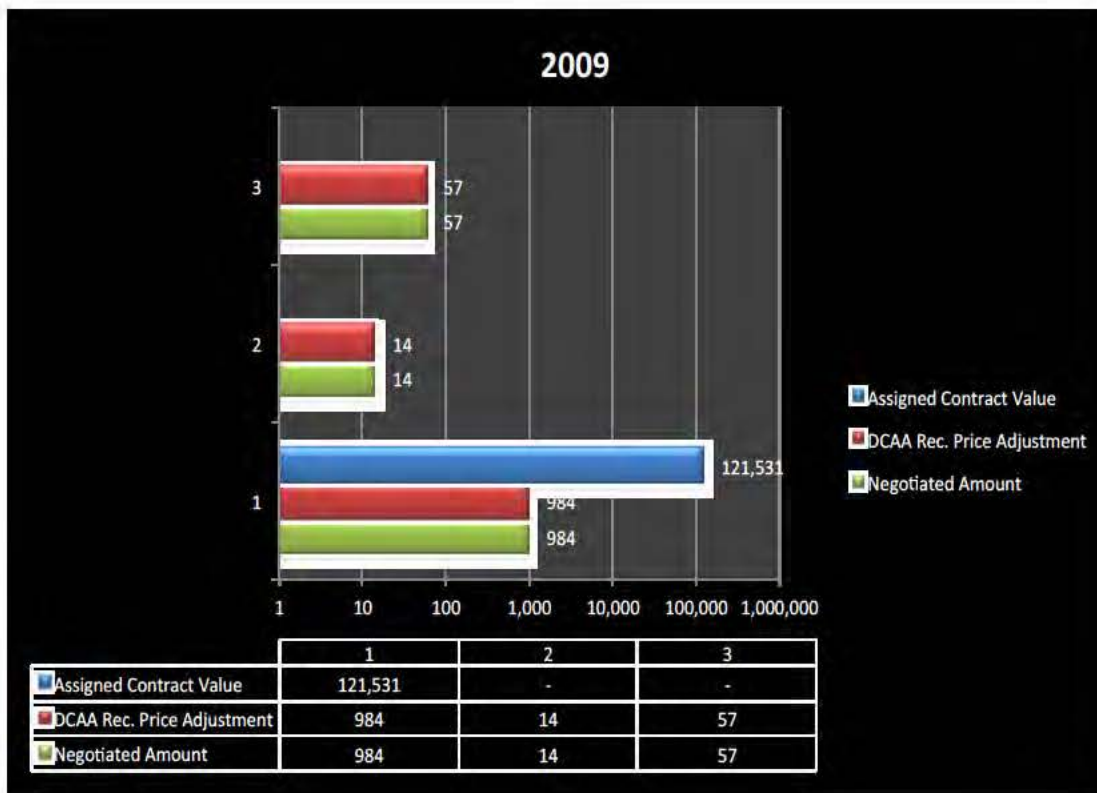
Figure 4.   2009 Resolutions/Settlements (from DCAA, 2014)

The remaining Figures 5–9 display information pertaining to years 2010 through 2014 respectively.

Figure 5. 2010 Resolutions/Settlements (from DCAA, 2014)

Figure 6.   2011 Resolutions/Settlements (from DCAA, 2014)
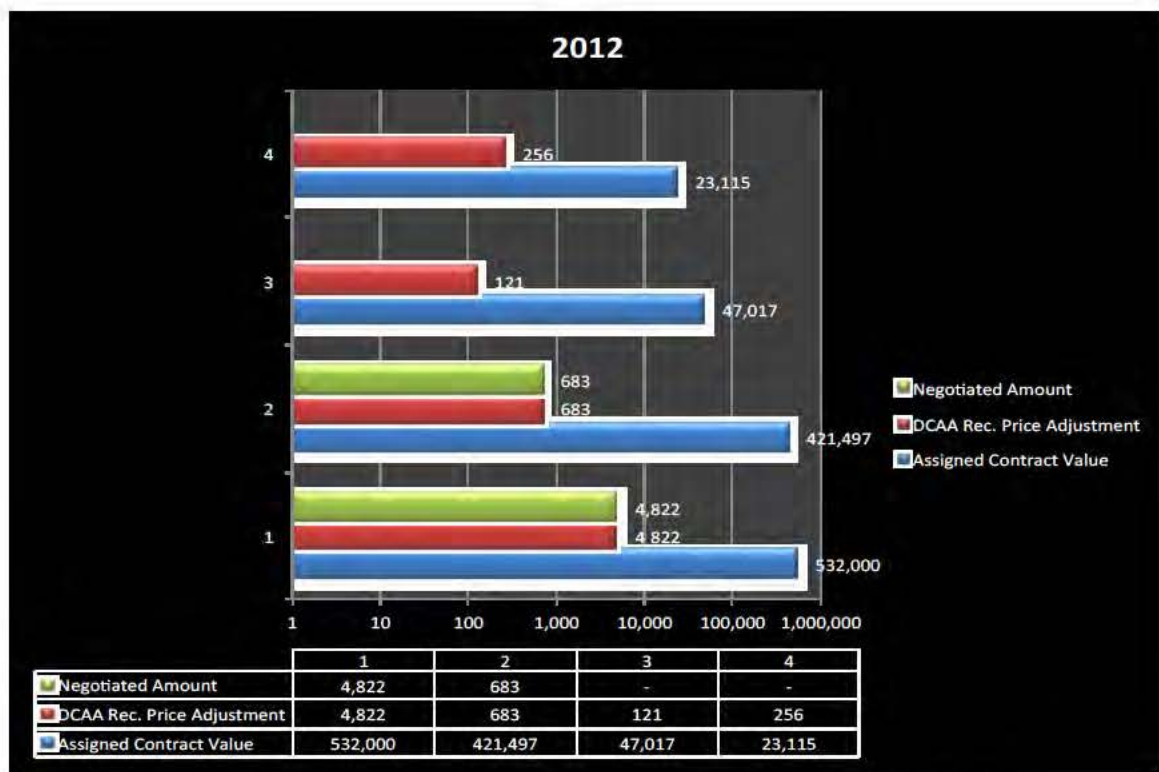
Figure 7.   2012 Resolutions/Settlements (from DCAA, 2014)
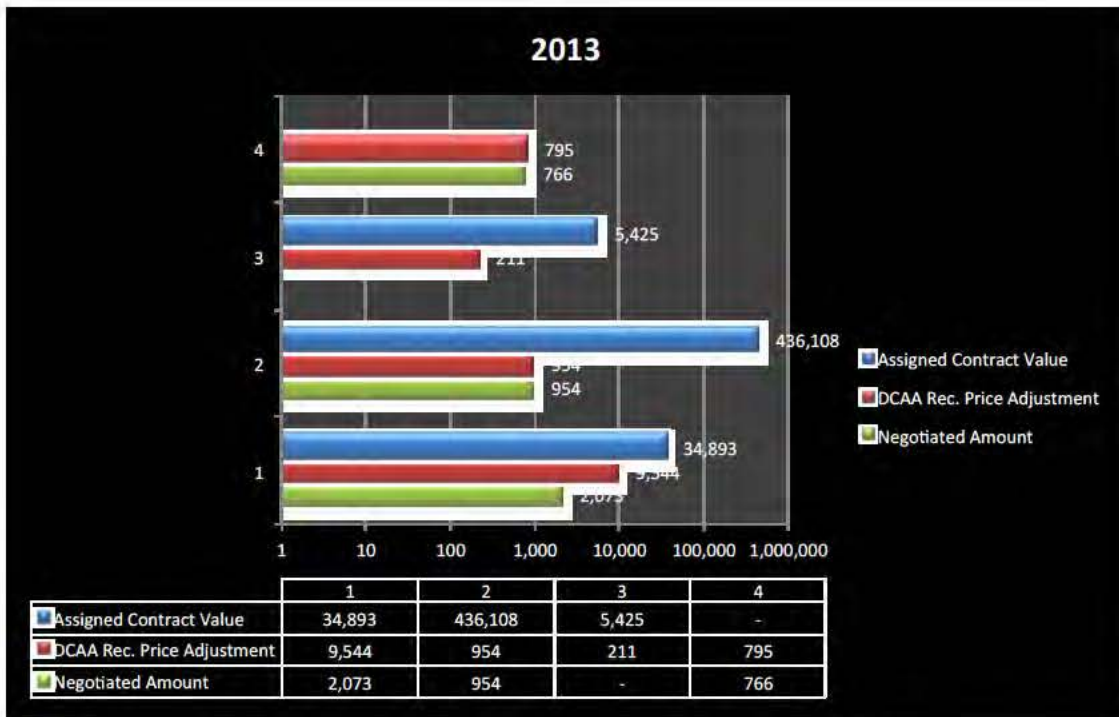
Figure 8.   2013 Resolutions/Settlements (from DCAA, 2014)

2014

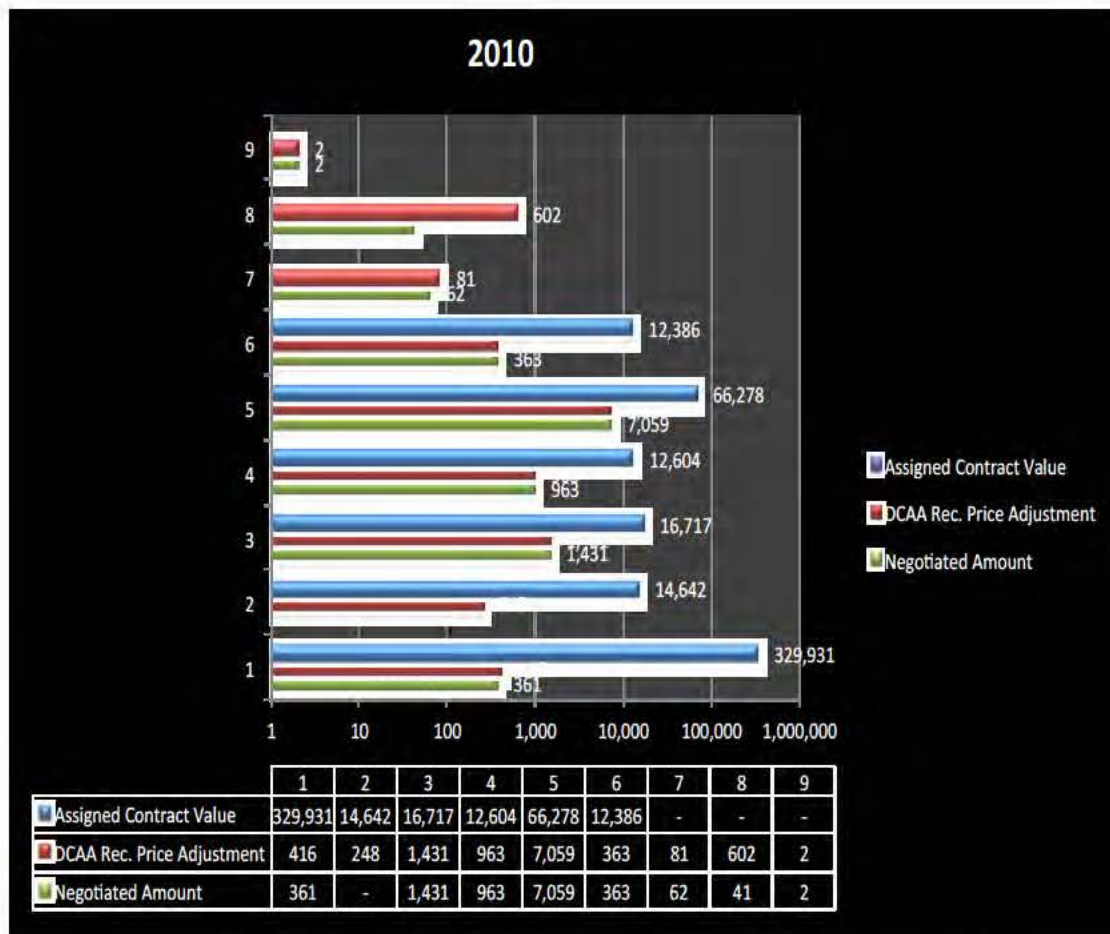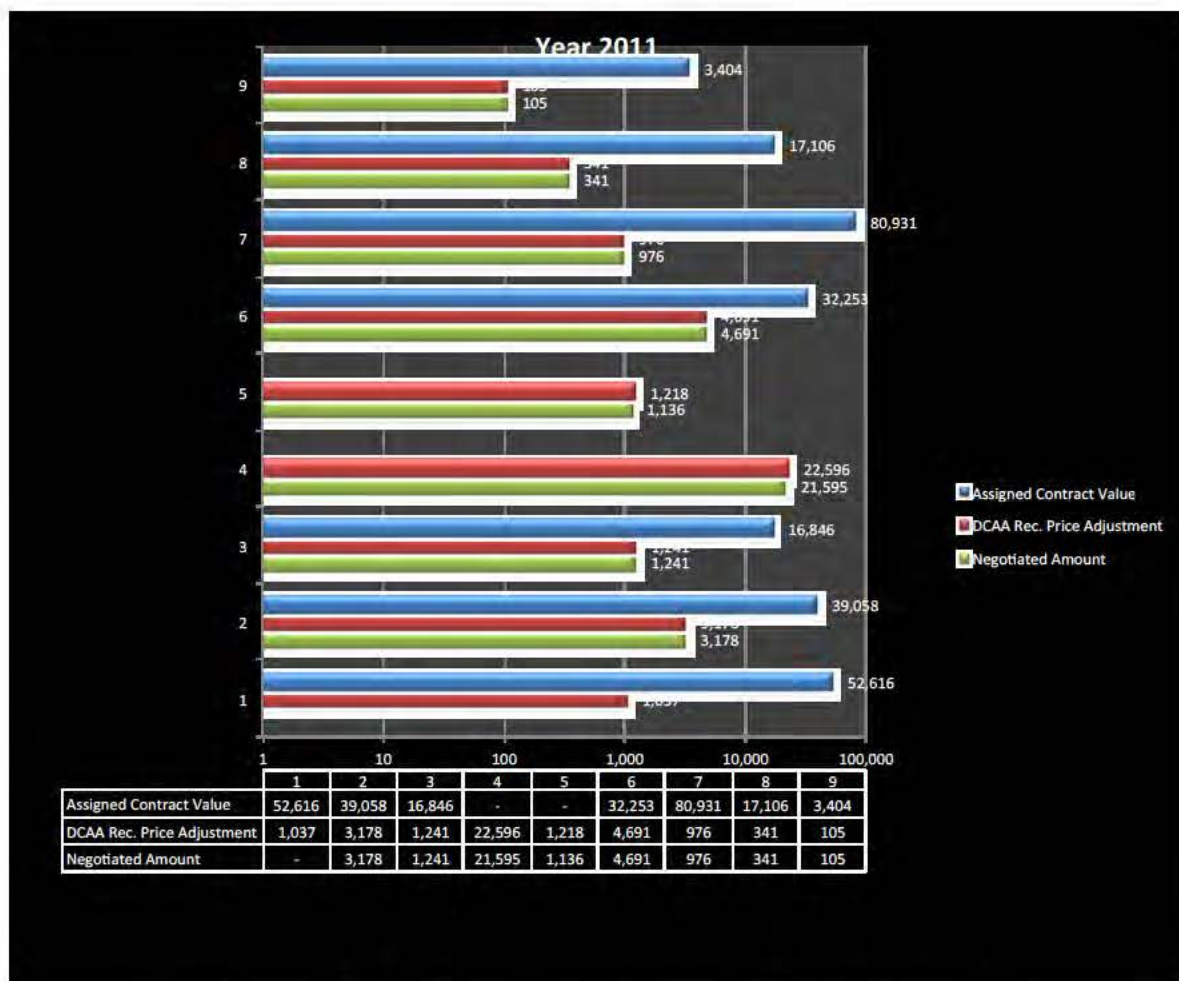|	1	2	3	4	5	6	7	8	9	10
Assigned Contract Value	196,710	19,085	,207,665	-	14,474	207,288	41,384	1,040	-	8,473
DCAA Rec. Price Adjustment	177	106	2,645	477	490	608	813	763	434	474
Negotiated Amount	177	-	-	224	490	50	813	763	434	474
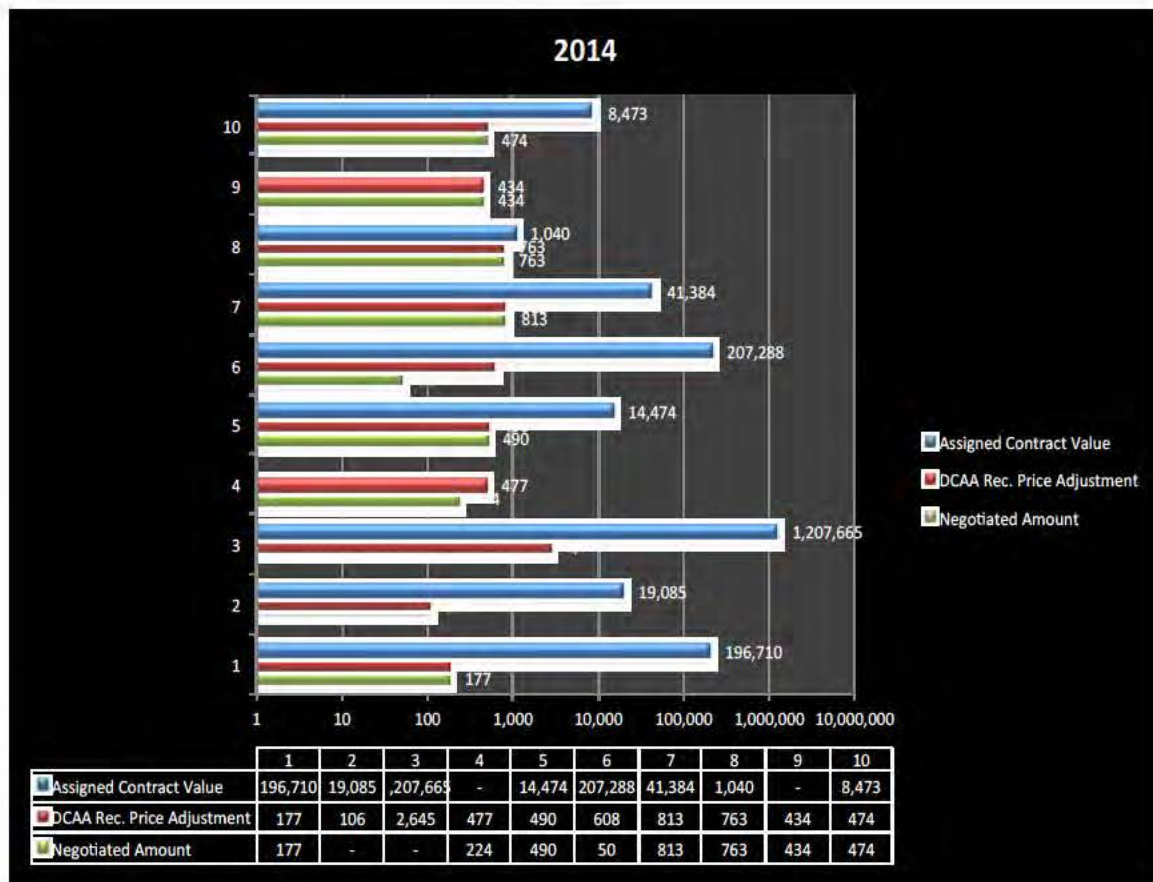
Figure 9.   2014 Resolutions/Settlements (from DCAA, 2014)

To summarize, the evidence above demonstrates the value of TINA. With the use of TINA, the DOD is provided a blanket of protection in the form of an audit, which allows the DOD to recoup any over-inflated negotiated prices due to contractors submitting defective certified cost and pricing data. Along with the provided information included above, DCAA also includes the following statement "Not shown, is the set of positive Defective Pricing (DP) reported assignments issued since 10–01–2008 that have not yet been resolved/settled. That is 75 assignments with a grand total of approximately $290M in recommended price adjustments attributed to defective pricing" (DCAA Representative, personal communication, August 28, 2014).

It is also worth noting that the benefits shown above are only part of the TINA success. It is reasonable to conjecture that TINA effectively deters many federal

33

contractors from engaging in procurement fraud or defective pricing, which they could have done had TINA not been in place.

B. TINA REDUCES INFORMATION ASYMMETRY AND LIMITS INFORMATION RENTS

As elaborated in the literature review, DOD acquisition contracting is subject to both adverse selection and moral hazard problems. Consequently, policy makers have two objectives: mitigating adverse selection by limiting information rents that arise from information asymmetry (hidden information) and inducing the cost-saving effort to mitigate the moral hazard problem (hidden effort).

We believe that TINA does a reasonably good job in tackling the adverse selection problem and indeed reduces information rents from otherwise much more informed contractors. TINA accomplishes this goal because it allows contracting officers to negotiate fair and reasonable prices associated with the procurement by having contractors certify their costs and pricing data when the contracting officer has no other means for negotiating fair and reasonable prices. TINA reduces information rents that would otherwise have occurred due to contractors having inside price information that isn't available for the contracting officer. It also holds the contractor accountable to their prices with the use of audits to ensure inflated pricing have not occurred at the completion of the procurement. However, we want to caution policy makers that this does not mean TINA fully removes information asymmetry, and completely eliminates information rents. Rather, by requiring contractors to submit "cost or pricing data" that are "current, complete, and accurate," TINA alleviates the rent seeking behavior in a meaningful way, especially on the part of the information that is ex-post verifiable. So what exactly is *information rents*?

> …having private information gives the player possessing it a potential strategic advantage in his dealings with the other player For example, consider a seller who has better information about his costs than his buyer. By behaving as if he had high costs, the seller can seek to induce the buyer to pay him more than she would if she knew he had low costs. That is, he has an incentive to use his superior knowledge to capture an "information rent. (Caillaud & Hermalin, 2000, p. 1)

What TINA does to reduce information rents is to mandate that contractors provide certified cost and pricing data and legally hold them accountable in order to ensure that contractors are submitting legitimate cost and pricing data. With the potential use of auditing, DCAA ensures that contractors submit accurate and complete contracting data to avoid being audited and having the potential of the government recouping funds from the contractor.

C.   SUMMARY

This chapter focuses on what TINA does well. We first use the DCAA data to illustrate the effectiveness of TINA in deterring fraud and defective pricing. Further, we point out that TINA reduces information rents by requiring contractors to submit "cost or pricing" data that is "current, complete, and accurate." The next chapter will discuss what TINA does not do well.

THIS PAGE INTENTIONALLY LEFT BLANK

V. WHERE TINA DROPS THE BALL

A. INTRODUCTION

As pointed out in Chapter III, defense procurement is subject to both adverse selection and moral hazard problems, consequently, limiting information rents and incentivizing contractors' cost-saving effort become two main policy objectives for the government.

Chapter IV argued that TINA, to some extent, mitigates the adverse selection problem by mandating that contractors provide certified cost and pricing data that are "current, complete, and accurate" and legally holding the contractor accountable. Hence, it is fair to say that TINA helps policy makers achieve one of their two policy goals: limiting information rents. On the contract vehicle spectrum, properly using cost reimbursement and fixed price contracts when appropriate (see Figure 2) will help reduce risks of moral hazard and adverse selection. However, because TINA only requires contractors to provide cost or pricing info and not necessarily visibility of effort, contracting personnel must rely on alternative regulations and surveillance to ensure contractor performance.

This chapter, however, emphasizes the ineffectiveness of TINA. In particular, building on an economic-based, incentive-centric approach that investigates contractors' incentives, we argue that a main flaw of TINA is its failure to address the moral hazard problem. In cases such as cost reimbursement contracts, where moral hazard is an inherent concern to begin with, we argue that TINA fails to provide remedies for existing conditions. In other cases such as fixed-price contracts, where moral hazard is otherwise appropriately addressed, we argue the use of TINA undesirably removes contactors' incentive to exert effort. Therefore, TINA, in the context of fixed-price contracts, is the problem rather than the solution.

B. CONTRACT PRICING

In contract pricing, proposal cost estimation is based on contractors' minimum cost to deliver quality goods and services which factor in profit and risk (Figure 10). It

can be assumed that cost is variable based on numerous offerors' proposing prices and competition within the industry. The target contract price is determined by how the offeror estimates target high and low cost.
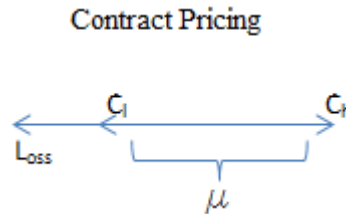
Contract Pricing

Figure 10. Contract Pricing

Depending on where C_a (actual cost) is on the horizontal plane, a contractor will be operating at a profit within cost-high and cost-low parameters. Cost or pricing data gathered by the contractor during contract performance will then determine the accuracy of their estimates in comparison to actual costs, C_a. In contracts without TINA governance, a contractor would want $C_a \geq C_l$ because any cost savings to the right of C_l (their minimum estimate that, if equal to contract price, they will receive no profit without cost savings) will translate into pure profit (μ) without penalty. Simply stated, $\mu = C_a - C_l$ and the larger the gap between the two values, the greater the profit will be.

However, the government would not know that the contractor was able to save money and how large the profit-cost gap was because certified cost or pricing data would not have been required. In the case of obtaining the lowest price, the government may suffer from information rents that reach beyond the current procurement; information rents also adversely affect future contracts if previous contract prices are used as a basis for price fair and reasonableness in limited competition. Under cost reimbursement type contracts, the contractor is reimbursed for costs and are not incentivized to reduce costs or even to control any high or excessive expenditures. Because of situations like these, TINA is not only needed to reduce moral hazard but also adverse selection.

However, in contracts governed by TINA provisions, cost estimation is more complex. Proposed contract price may be variable based not only on minimum costs to deliver quality goods and services, but also with the risk of defective pricing when costs

must be certified. Once offerors submit cost or pricing data and it is certified, the contract is then executed and the certified cost/price becomes the baseline. Any deviation of data results in a red flag for defective pricing and thus moral hazards play a part in determining contract price. In other words, TINA penalizes contractors to reduce costs that make the negotiated cost or price significantly different than actual cost or price when implemented. Figure 11 illustrates the relationships between negotiated cost, actual cost, and defective pricing over time:
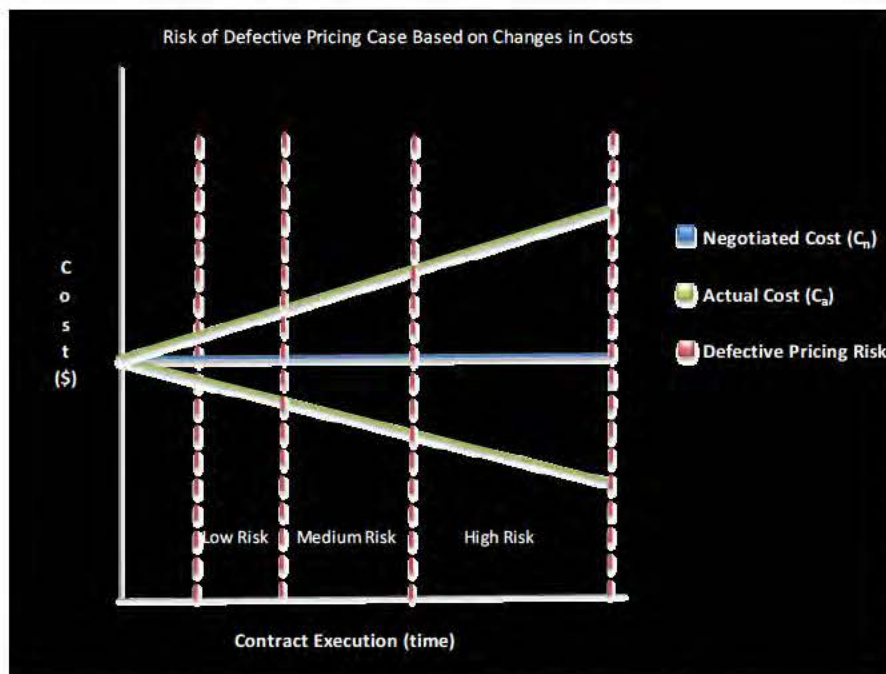
Figure 11.   Risk of Defective Pricing Case Based on Changes in Costs

As the gap expands between C_a and C_n, the risk that the negotiated price was based on defective cost or pricing data increases. As shown by Figure 11, this gap can be caused by both actual costs increasing or decreasing from negotiated cost estimates. Although some unexpected cost deviations may result from unforeseen events or actions inherent with estimating long term fixed price contracts, there is a risk that cost deviations were the result of the contractor submitting cost estimates that were not current, accurate, and complete. A small deviation from negotiated prices may not set a red flag for defective pricing, but over time, a contractor is more susceptible to accrued

changes. Additionally, as time goes by between negotiated contract costs (C_n) at the time of award and actual final costs at the conclusion of the contract, the contractor's risk of defective pricing increases if foreseen changes occur, and those changes were not properly disclosed. Upon submission of the proposal and until costs are negotiated, offerors are responsible for ensuring the cost or pricing data is current, accurate, and complete. Often, if defective pricing occurs, it will occur before a pricing agreement is reached and prior to contract start-date (DCAA Representative, personal communication, Dec 3, 2014). Additionally, throughout the phases of the contracting process and the longer the contract period of performance is, the more evidence is available to auditing personnel as to whether negotiated prices stated were based on defective cost or pricing data. If there is evidence showing significant cost underruns, there is a risk that some portion of the underrun is attributed to a higher negotiated price due to defective cost or pricing data (2014). Consequently, programs that experience cost overruns in the acquisition life cycle may be because of poor cost estimates and had better estimation occurred then actual reported costs might have not deviated as significantly from negotiated costs.

Cost deviations (overruns or underruns) however, are merely one indicator that auditors use to determine whether contractors have complied with TINA regulations prior to a pricing arrangement being made. As previously stated, prior to price negotiation, defective pricing can occur prior to the contract start-date. Many times, the information that could provide evidence of defective data can be provided by the offeror prior to negotiated costs. Such information includes undisclosed subcontracting cost or price negotiations, communications between contracting and subcontracting offerors indicating lower prices, and undisclosed historical labor hours or material costs (2014). Risk factors for defective pricing may also be non cost-based. Examples included below (DCAA Representative, personal communication, December 4, 2014):

> 1. Post Negotiation Memorandum: estimates may have been based on abstract estimates or costs, such as from engineering estimates, despite the undisclosed existence of historical costs.

2. Auditing Timeframe: Auditing work takes a lot of time and could have delays. If no updated cost or pricing data is submitted during the time of auditing (e.g., new quotes on labor or materials, etc.) it could be due to the fact that the contractor's system designed to disclose updates is malfunctioning.

3. Changes to Processes: Any changes to processing (i.e., manufacturing or materials) may affect the cost or pricing structure of a final product. It could be positive and result in less lead-time or lower costs. If process changes occur soon after contract award, there is a possibility that the contractor had implementation plans prior to reaching price agreement, but failed to disclose such plans.

Any changes in cost or pricing data should be reported or the contractor may find that upon audit, penalties may be owed if it is found that 1) the negotiated baseline should have been adjusted, or 2) the contractor knew or should have known that they willingly withheld information. Cost handling based on profit can be shown in Table 2 of the next section.

C.   DISTORTED INCENTIVES: USE OF TINA WITH FIRM FIXED PRICE (FFP) CONTRACTS

In this subsection, we express our greatest concern over TINA. That is, unintended disincentives are created if TINA is used with a FFP contract. In the following, we use a step-by-step approach to illustrate the problem.

Since 2009, support for firm fixed price contracts has been steadily increasing in order to limit government risk, reduce cost overruns, and improve contract effectiveness (Wang & San Miguel, 2013, pp. 1–2). As such, there has also been a strong policy push towards regulation in support of fixed price contracts to be a fix-all to the cost overruns DOD faced in prior years. Top leaders, including President Obama, Robert Gates, former Secretary of DOD, and Ashton Carter, former Under Secretary of Defense for Acquisition, Technology, and Logistics, all expressed their favor toward more use of FFP contracts in DOD acquisition. The presidential memorandum issued to Chief Acquisitions Officers in March 2009 (Obama) explicitly stated that ''there shall be a preference for fixed-price type contracts''(p. 1). This news came after an investigation by GAO in 2008 that stated 70 percent of DOD's major acquisitions programs had increases

in costs that totaled at least $295B in overruns. Consequently, more and more DOD contracts prescribe FFP. Although initiatives for proper firm fixed pricing when appropriate on the contract vehicle spectrum were enacted and 10 programs were cancelled and defunded, by 2012 at least $260B of funding needed for the continuation of the remaining major defense programs were a result of cost overruns (Government Accountability Office, 2013, p. 6). We argue that perhaps changing the contract vehicle with TINA governance is not the best solution to cost overrun prevention.

As previously discussed, TINA changes the way contractors report cost or pricing data as well as how contractors behave. It is noted that a main reason for the push to FFP contracts is because they provide the least amount of risk to the government in terms of cost overruns. Table 3 demonstrates how cost changes can affect actions taken by the government and the contractor:

Changes	Fixed Price Actions		Cost Reimbursement Actions	
	Contractor	Government	Contractor	Government
Cost Changes Paid by	Yes	No	No	Yes
Contractor Profit Changes	Yes	-	No	-
Moral Hazards Present	Yes - hidden effort, shirking, cost padding (caused by TINA)	COR/QA and DCMA oversight	Yes - hidden effort, shirking, cost padding (strengthened by TINA)	COR/QA and DCMA oversight
Adverse Selections Present	Decreased - hidden information eliminated by TINA	TINA, DCAA Audits	No - costs reported for reimbursement	TINA, DCAA Audits
Cost Decrease Incentive (without TINA)	Yes	-	No	Yes
Cost Decrease Incentive (with TINA)	No	-	No	No
Cost Overruns	Absorbed	-	Reported	Paid

Table 3.   Effects of Cost Deviation on Contracts Governed by TINA

Given the more frequent use of FFP in the DOD procurement, it has become increasingly more important to understand how contractors' incentives change with respect to the enforcement of TINA within FFP contracts. In particular, we will use a "without and with" approach to demonstrate the unintended negative consequences of utilizing TINA with FFP contracts.

1.   **FFP contracts without TINA, despite many weaknesses, are free of Moral Hazard problem.**

Wang and San Miguel (2013) challenge the wisdom behind policy-makers' favor toward FFP contracts. In particular, they state: "the notion that fixed price contracts are better than cost-plus contracts for limiting cost overruns is misleading" (p. 1). The article further explains that FFP contracts may in fact have three negative consequences: (1) Fixed-Price Contracts Provide Few Risk-Sharing Benefits; (2) Fixed-Price Contracts Lead to Higher Government Payments; (3) Unjustified Favor toward Fixed-Price Contracts Promotes Inefficient Industry Structure.

Nevertheless, despite the problems pointed out by Wang and San Miguel (2013), FFP contracts do have one appeal: that is, a FFP contract is a high power incentive scheme that effectively motivates contractors' maximum efforts. Once a FFP contract is awarded, the contractor relentlessly seeks to reduce cost because every dollar saved on cost will directly translate into profit. Stated equivalently, contractors under FFP contracts without TINA voluntarily abstain themselves from shirking, i.e., moral hazard is not a problem at all (p. 4).

2.   **FFP contracts, with TINA, lose the last benefit of being a high power incentive scheme.**

It is important to understand what incentives or disincentives are created or removed if TINA is combined with a FFP contract. One astute observation by Rogerson (1994) is "TINA cannot force defense contractors to reveal the lowest possible cost that they could produce at if they exerted an optimal effort. Rather, it essentially tells them that the price they negotiate must be close to the cost they actually incur." As previously discussed and illustrated in Table 3, the government does have policies in place to ensure contractor oversight and surveillance. If policies are utilized properly along with thorough market research, qualified acquisition teams, and quality assurance plans, acquisition personnel can successfully help reduce the gap between negotiated and actual costs. However, contractor surveillance and oversight only occurs after contract award; TINA is the governing body for ensuring offerors' cost or pricing data is certified prior to

acceptance of offers *and* it strengthens oversight by disallowing deviation throughout contract execution.

As a result, a contractor under FFP contract that is subject to TINA, has the following ill incentive: The fear of being held accountable for any significant unfavorable cost discrepancy (i.e., the actual incurred cost is significantly below the ex-ante cost estimate negotiated with DOD as the basis for contract fixed-price) would strongly motivate the contractor to shirk (i.e., reduce cost-saving effort) or even engage in cost padding (for example, by opportunistically incurring or allocating more costs to the government contracts), especially when the actual costs are lower than negotiated cost or price estimates.

In the situation above, shirking becomes a dominant strategy because low levels of effort are a disutility to the contractor with additional risk of being penalized by TINA. In the case of a very favorable cost scheme (i.e., if every exogenous factor turns out to be good), if shirking is not sufficient to bring the cost close enough to the ex-ante cost estimate that was negotiated, the contractor will engage in opportunistic and hard-to-detect cost padding to ensure the reported costs do not raise red flags.

To recap, TINA, in the context of FFP contracts, removes the last benefit of FFP contracts and literally turned a high power incentive scheme to a low power one. Here, moral hazard problem is reintroduced by the misuse of TINA.

3.   A Numerical Example

We use the theoretical framework in Laffont and Tirole (1993) to set up a numerical example to illustrate the point made in prior sections. A contractor's cost function is specified as follows:

$$C = c(\beta, e) \tag{1}$$

where β is a state parameter (e.g., technology) and e is the effort. One can interpret that β is the adverse selection parameter and represents contractor's private information, and e is the moral hazard parameter.

44

Without losing generality, assume the state parameter β has three possible outcomes: good, neutral, or bad, with equally like probability. Moreover, the contractor can choose either work hard (e=10) or shirk (e=1).

Case 1) Favorable situation: (β=10), with probability 1/3.

$$c = 10 + \frac{10}{e} \qquad (2)$$

Case 2) Neutral situation: (β=20), with probability 1/3.

$$c = 20 + \frac{10}{e} \qquad (3)$$

Case 3) Poor situation: (β=30), with probability 1/3.

$$c = 30 + \frac{10}{e} \qquad (4)$$

It is reasonable to assume that the contractor knows the probability distribution of the natural state, whereas the government does not know. We also assume that the contractor's negotiation strategy is to ensure breakeven even in the bad situation and he or she can still shirk. So the contractor will propose $40 as the cost estimate by Equation (4), and the government would most likely to accept, with TINA control stating that if the incurred cost is more than 25% lower than $40 (i.e., below $30), then the contractor is subject to a TINA audit. This approach is similar to how DCAA determines defective pricing when auditing contracts. Let's also assume that this is a one-time static game in which no further contract is possible. The contractor tries to maximize its profit.

The sequence of the actions is as follows: the contractor proposes the bidding price, which is accepted by the government, who attaches TINA to the FFP contract. Then the natural state is revealed, the contractor chooses their level of effort, and finally the cost is incurred.

If Case 3 occurs, the contractor will choose to work hard (e=10), so the cost is $31 by Equation (4), TINA audit is not triggered, and the contractor earned a profit of $9. There is no Morale Hazard problem.

In the case of a neutral situation, if the contractor works hard (e=10), his or her cost would be $21 by Equation (3), which is good in the absence of TINA, yet not so when TINA is in place. Because any cost below $30 would trigger a TINA audit. The contractor, knowing this risk, would choose to shirk (e=1) so the cost will be $30 by Equation (3), which successfully hides the contractor under the radar of TINA. Now TINA *creates* moral hazard problem.

What if the most favorable natural state emerges? In that case, if the contractor works hard, he or she will incur a cost of $11 by Equation (2), which is going to raise a big red flag to the government. Therefore, the contractor is going to shirk, however, because the natural state turns out to be so favorable, even shirking is not enough to mute the alarm of TINA. (Note that shirking in case 1 would yield a cost of $20, which is below the audit threshold value $30, and hence will trigger the TINA audit) So what would the contractor do to evade the TINA investigation? The contractor will engage in "cost padding" and artificially increase the reported cost to at least $30, so he or she will not get into trouble. Now, TINA not only created a moral hazard, but it also generated bad incentives for defense contractors to engage in unethical and opportunistic "cost padding."

D.   FIXING INCENTIVES: FROM STATIC TO DYNAMIC PERSPECTIVE

1.   One-Shot Static Game

A good starting point is a static situation where no further contract is possible. Referring to the numerical example from Section A of this chapter, the government already paid $40, because the contractor can avoid TINA audit in all three possible scenarios by either "shirking" or "cost padding" or both, and because the government payment is fixed. The implication is straightforward: In order to correct the disincentives created by TINA in the context of FFP, policy makers need to waive TINA from FFP contracts, so that the FFP contract remains a high power incentive scheme. However, the

set back is that contractors are not required to provide any certifiable cost or pricing data when TINA is waived. Therefore, if the contractor does in fact save costs and reach higher profits, the government may no longer be informed of a cost-price differential and may continue to pay higher prices while contractors receive higher profits.

2.   Repeated Game with Non-Commitment

In the one shot static game (single-year term contract), when TINA is removed from a FFP contract the contractor is fully motivated to exert their best effort to maximize profit. Since no future contract is possible, the contractor is not afraid to reveal private information (i.e., the minimum cost that can be achieved through the best effort) because there is no possibility for the government to exploit the private information revealed against the contractor in the future.

However, in reality, the relationship between a typical contractor and the government is rarely a one-shot game. Rather, it is better characterized as a repeated game with a risk of non-commitment from the government. That is, the government may have a long-term demand for the product provided by the contractor, yet, by law, the government must procure from the contractor on yearly basis. Typically when multiple-year contracts are awarded, the government is agreeing to a single-year term contract with the option of additional years. Nearing the end of the current fiscal year, the government will begin the process of exercising the next option year. This decision is a unilateral process that a contractor may consider as non-commitment and in return may be apprehensive to share true cost or pricing data for fear of not receiving an additional option year. Predictably, the government will exercise the option years as long as there is still a need for the requirement (and contractor is receiving satisfactory performance ratings).

In a repeated game where contracts have one base year and option years which can be exercised by the government, a simple removal of TINA from a FFP contract may not be sufficient to induce the contractor's best effort. The contractor is in a very vulnerable position in the sense that if he or she chooses to reveal private information at the early stage of the game, that information may be used against him or her later so no

future information rents is possible. As discussed in Chapter III, contractors' fear of being "ratcheted up" by the government motivates them to withhold their private information so they can still extract information rents from the government in later periods. However, in a multiple-year contract, removal of defective pricing threats from the initial year may provide to be beneficial.

So what is the fix of the lack of incentives? If one-year FFP contract without TINA is not enough to motivate the contractor, the government should consider multiple-year FFP contracts without TINA defective pricing provisions. This is especially useful if the product is demanded on a continuous basis. Furthermore, if fixed price incentive contracts are utilized to encourage cost savings on contracts for the initial year term while rewarding a shared percentage of cost-savings as awards, then the contractor may by motivated to continue open communication and discourage information rents. The idea is: make the reward of revealing the best effort cost big enough, so the contractor voluntarily tells the government what is the lowest achievable cost. It is wise to let the contractor win early, win big, but only win once. The government, and hence the taxpayers, win in the long run and win even bigger.

3.   Multiple-Year Contracts: Numerical Example Continued

In this subsection, we extend the static, one-shot numerical example in Part B to a repeated game case. Under some reasonable assumptions, we show that government savings can be achieved by fixing contractors' incentives.

Without losing generality, assume the government needs to order this product every year for 15 years. If each year TINA is attached for 15 annual contracts, the contractor will always choose to shirk[4] or "shirk and cost padding" in order to avoid the TINA audit as well as keep the information rents for the future. Hence, the government will end up paying $600. Alternatively, if TINA is removed for every annual contract, TINA concern is removed; however, the contractor still worries about the consequence of revealing the lowest possible cost under the maximum effort due to the non-commitment

---

[4] Note that in contrast from the one-shot game, the contractor chooses to shirk even in the bad situation, due to the concern of being "ratcheted up" if the lowest possible cost is revealed.

nature of government contracts. One-year increased profit due to effort is meagerly too small to entice the contractor to give up their future information rents. Thus the contractor will still withhold effort and choose to shirk.

Without losing generality, assume that a 5-year FFP contract is sufficient to induce the contractor to exert his or her best effort. Therefore, the government commits to pay $40 each year for 5 years with no TINA governance required. With this commitment, the contractor is fully motivated to work as hard as possible and the lowest possible cost is revealed to the government. The government, who observes that the true expected lowest possible cost, cost is $21 (i.e., $\frac{1}{3}*11 + \frac{1}{3}*21 + \frac{1}{3}*31$) will use that information to price the future 10-year contracts. Under the assumption that a 10% profit is allowable, the government will offer $23.1 ($21*1.1) annual FFP contract for the reaming 10 years. So the total government payment now becomes $40*5+$23.1*10=$431, a saving of $169 relative to the original situation. Note that if time span is longer, say 25 years as opposed to 15 years, then the government savings will be even larger.

This information sharing, however, cannot be guaranteed. If the contractor is not obligated to provide certified cost or pricing data, there is no means for ensuring that all true cost-savings are being voluntarily reported. While the contractor is motivated to providing the lowest possible costs to their company, the same cannot be assumed for providing the lowest possible price to the government.

4.   TINA Waivers: A Useful Policy Tool?

As argued in prior chapters, TINA is effective in deterring outright fraud and "defective pricing," especially on the part of the cost that is verifiable. Hence, we should give TINA credit for doing that part right. However, TINA is much less effective to address the moral hazard problem, where one key determinant of the cost, namely effort, is unobservable, unverifiable, and non-contractible. TINA could even become very destructive when it is applied to a FFP contract setting, as shown earlier in this chapter.

Lawmakers allow TINA waivers and a shrewd utilization of that tool is essential for making a better use of TINA. As specified in Chapter II, one of the justifications for TINA waiver is "there are demonstrated benefits to granting the waiver." Our analysis in this chapter detailed the reasoning for the use of TINA waivers. Based on our analyses, we recommend policies options below:

If a FFP contract is negotiated with a contractor who is unlikely to have continuous contracting relationship with the government for the same or similar products and services, then a waiver of TINA should be applied. However, as it can sometimes be difficult to predict the future of non-continuous relationships until after the first year of performance, simply utilizing a TINA waiver may not be an effective solution. Federal Acquisition Regulation allows for certain TINA waivers under HCA approval.

a.   Increasing the use of TINA waivers may be a plausible solution if reasonable expectations exist that fair and reasonable pricing is already established. For example, per FAR 15.403–1(c)(4) the HCA may waive the requirement for contractors (and lower-tiered subcontractors) to provide certified cost or pricing data if such data was previously submitted and is updated. Allowing for more waivers is an "easy-fix" to lowering defective pricing cases, but it may not be the most effective in reducing disincentives attached to TINA. Waiving TINA may also subject the government to information rents that were previously mitigated. Simply waiving policy when a need for it still exists is, in and of itself, an ineffective policy solution.

b.   If a FFP contract is negotiated with a contractor who is likely to continue to provide the same or similar product to the government for years to come, then a multiple-year FFP contract, without TINA provisions on defective pricing data, should be offered to motivate the contractor's best effort. Note that in this setting a multiple-year contract is needed.

E.   TINA AND COST REIMBURSEMENT AND INCENTIVE CONTRACTS

TINA is less damaging when it is combined with cost reimbursement contracts. In such contracts, moral hazard is an inherent concern to start with, TINA does not introduce the problem, nor does TINA solve it. Under a cost reimbursement contract, the

contractor shirks anyway, regardless of the presence of TINA. To the extent that total realized cost is auditable while the various components of total cost are not (Laffont & Tirole, 1993), "cost padding" would still be possible. That said, TINA does make the verifiable part of the cost more credible, and also provides disincentives for contractors to engage in outright fraud and "defective pricing" behavior.

Incentive contracts are basically intermediate arrangements between fixed-price and cost reimbursement contracts. Hence, similar to FFP setting, but to a less degree, any cost-saving incentives under incentive contracts would be weakened by TINA because incentives associated with intermediary contract types are hindered. The government may change contract type depending on the life cycle of the acquisition program and it is important to know how TINA will affect contracts within each milestone of a program. Throughout the life cycle of the acquisition, a requirement may move along the contract type spectrum to take into account new discoveries and established requirements. Because of this, TINA should also be a living-breathing provision that takes into account the different contract used in major acquisition rather than an end-all to pricing uncertainty. Because there are certain adverse selection issue sand moral hazards that are unique to differing contract types, acquisition personnel will need to be aware of which disincentives may be occurring for each contract type at each phase of the acquisition life cycle. Similar to the disincentives associated with TINA provisions, cost-savings under shared-risk contracts will also be weakened by TINA.

F.   CONCLUSION

The overwhelming majority of defective pricing has occurred on fixed price type contracts (Defense Contract Audit Agency, 2014). In fact, this overuse causes a clash with governmental prerogative; use of FFP is encouraged due to its limit in government risk, but TINA increases that risk by eliminating the contractors' incentives to reduce incurred costs. Additionally, fixed price type contract vehicle use in high-risk situations have negative unintended consequences that reaches beyond contractor shirking and moral hazards and moves additional costs to the contractor that may not be incurred if TINA provisions were not in place.

It is apparent that although there are cost overages on cost reimbursement type contracts, contractors are still not being held responsible with TINA provisions, nor is the level of effort required to eliminate cost overages being properly exerted in doing so. In a GAO report from 2009 regarding cost reimbursement contracts, GAO officials stated that it is unclear whether or not cost controls are being measured properly to determine if spending is justly above budgeted spending. Of the selected weapons programs GAO reviewed from 2011 to 2013, each year the portfolio of major weapons programs decreased (and funds were de-obligated) while the costs for remaining programs exponentially increased. In 2013 alone, the cost of major weapons programs increased by $14.1B even though many of the programs had begun or completed transitioning from cost reimbursement type contracts to fixed price type contracts (Government Accountability Office, 2013). It would seem that the link between the push for FP contracts and the intended goals of TINA might be leaving too much room for misinterpretation and that a refinement in policy is necessary.

The next chapter will summarize our research, present our conclusion, and identify areas for further research.

VI. SUMMARY, CONCLUSION, AND AREAS FOR FURTHER RESEARCH

A. SUMMARY

Based on a review of TINA institutional knowledge and academic literature, this research performed an economic analysis of TINA. The analysis focused on how the current use of TINA affects contractors' incentives in various contract settings. In particular, while we acknowledge the effectiveness of TINA in mitigating adverse selection problem and limiting information rents, especially on the verifiable part of the cost, we conclude that TINA may not be effectively incentivizing contractor effort. Regarding the effectiveness of TINA, this report also analyzed how TINA limits contractor incentives through different contract types on the contract spectrum. The goal of TINA is to ensure fair and reasonable pricing when contracting for goods or services in various settings of price thresholds, unique items, and competition. Although TINA is successful in achieving this goal, its success is not without adverse side effects.

Through numerical examples, we argued that TINA fundamentally fails to address the moral hazard problem in cost reimbursement and fixed price type contracts. In some cases, such as FFP contracts, a strict enforcement of TINA intensified the moral hazard problem. Contractors' fear of being held accountable for any unfavorable cost variance would motivate "shirking" or engaging in "cost padding" that is suboptimal, leading to welfare loss and damage to tax payers. In cost reimbursement contracts, moral hazards are already present and should be addressed. Building on our study, we make corrective policy recommendations, which will be summarized in the next subsection.

B. CONCLUSIONS

The purpose of this research was to provide an economic view of TINA in regards to what TINA does well and where TINA can be improved upon. The foundation of our research included three main questions that were discussed in Chapter I.

1. Does TINA provide the proper incentives (or disincentives) for DOD contractors to induce their best effort?

The goal of TINA is achieved when contractors are required to provide certified cost or pricing data. Because fair and reasonable prices are achieved when certified cost or pricing data is verified to be current, accurate, and complete and trackable by approved cost accounting systems, TINA is lauded as successful. However, the incentives (or disincentives) created by TINA have effects on contractor effort and provided information.

Depending on the contract type, TINA provides both incentives and disincentives for DOD contractors to induce their best effort. Firm fixed price contracts that are not governed by TINA are free of moral hazards because contractors will provide their best effort in order to reduce costs. However, when TINA provisions govern FFP contracts, the high-power incentive scheme that was present is now eliminated. Contractors may factor in TINA and risks of defective pricing and utilize cost padding thus raising the final price of the contract. Additionally, contractors may begin to shirk during contract performance and only provide that level of effort, which keeps costs within the negotiated range. Quality assurance personnel and Contract Officer Representatives can somewhat mitigate the problem, yet cannot fundamentally address the issue.

Cost reimbursement type contracts are already subject to moral hazard because contractors have few incentives to control costs, with or without TINA provisions. However, as stated in Chapter V, TINA does provide some disincentives for the contractor to avoid fraud when providing certified cost or pricing data.

2. What incentive-compatible policy implications can be generated from this scenario based analyses and economic research?

Contractors should be incentivized to win in the short-run while DOD benefits in the long run. By allowing the contractor short-term wins, DOD enables contractor's best effort and obtains otherwise unavailable cost information. Under long-term contracts not subject to TINA, a contractor has the greatest incentive to reveal true cost and pricing data throughout the life of the contract. The cure for the unintended consequences on contracts governed by TINA is two-fold:

1. On fixed price contracts, continue to utilize TINA to allow government access to certified cost or pricing data, but revise TINA defective pricing penalties to incentivize contractors to reduce costs
2. On fixed price contracts with revised TINA provisions, use long-term contracts as a preferred method of contracting

Revising TINA defective pricing penalties for the first term of a contract supports contractors in the short-term while ensuring DOD long-term goals for fair and reasonable pricing. Requiring contractors to submit certified cost or pricing data but waiving the threat of defective pricing actions will still ensure the government ensured that fair and reasonable pricing is met and provide the contractor incentives to exert their best effort. The moral hazards associated with providing just enough effort to remain outside of the risk of penalty and cost padding due to that associated risk can be mitigated. Furthermore, information is not hidden from the government so adverse selection would not occur. Although one step further in this solution would be to waive TINA altogether, doing so would increase adverse selection – contracting officers would have a lack of information because contractor would no longer be subject to submitting certified cost or pricing data and moral hazards associated with cost reimbursement contracts would remain present.

The TINA revision scheme above is best utilized with multiple-year contracting where the first term of the contract would not be subject to defective pricing penalties but each option year exercised would be. Contractors should not feel threatened if costs are significantly reduced during the first year, nor should the contractor be penalized if costs are justifiably increased.

3. How should TINA Be Used in a Dynamic Setting?

The solution above must be dynamic rather than static – contractors may be able to win in the short-run by revising TINA provisions while still allowing the government to win in the long-run with defective pricing consequences implemented at a later point in the contract life cycle and different levels of uncertainty. Included in first-time awards or new and emerging requirements, room could be made for allowing contractors without approved accounting systems to work more closely to ensure compliance if specified levels of effort are being exerted. Allowing for dynamic flexibility will also allow for contractors to reveal true cost or pricing data before they are certified and locked into a

contract. This will also allow for long-term government goals to match with long-term government contracts and incentivize the efforts of contractors. As a defense program moves through the acquisition life cycle, the contract type should also migrate from cost reimbursement type contracts towards incentive-based cost contracts and then fixed price contracts where incentives for cost savings and risk can be shared by both the contractor and the government.

C.   AREAS FOR FURTHER RESEARCH

Based on our research findings, we provide the following areas for further research:

1.   Do Fixed Price Contracts Present Similar Situations as Government Budgeting?

As stated in this report, policies that are present for contract performance oversight are in place. However, the way that fixed price contracts are governed by TINA presents a similar situation to government budgeting in a sense that less costs in the current fiscal year creates penalties. Budgeting personnel use previous fiscal year dollar amounts as a basis for future fiscal budgeting and thus similar amounts of funds are requested year after year. The government is not only penalized for not spending all allocated amounts at the end of term, but also for fraud, waste, and abuse if purchases do not meet bona fide needs. This situation is similar to contracts governed with TINA because contractors must remain close to negotiated price or cost terms and thus deviating (even in the benefit of the government) from negotiated estimates raises the red flag for defective pricing data. A review on government budgeting process may give insight to the process surrounding cost processes of government contracts.

2.   Does the Utilization of Fixed Price Type Contracts Prevent Cost Overruns?

When the DOD began to implement better buying power initiatives in 2010, there was a strong push for fixed price contracts instead of cost reimbursement contracts to prevent the government from paying cost overruns. However, this directive may have been misunderstood as utilizing fixed price contracts early in the acquisition stages of

major defense programs rather than transitioning later in the life cycle. In a GAO Report analyzing contract management with cost reimbursement contracts (2009), GAO stated,

> The FAR does not specifically require a transition plan from a cost-reimbursement contract to one with firmer pricing. However, the FAR states that in the course of an acquisition program, a series of contracts, or a single long-term contract, changing circumstances may make a different contract type appropriate in later periods than that used at the outset. Information important to such an effort would include…revisiting the government's requirements to determine whether they can be better defined. (Government Accountability Office, 2009)

Determining the success of contracts who have transitioned from cost reimbursement type contracts to fixed price type contracts can help determine what lessons learned need to be leveraged in order to mitigate poor policy practices, if any are present. TINA cannot be used as a crutch for contracts that do not have accurate cost or pricing estimates and changing contract type is not the remedy. The link between cost overruns and poor cost estimation should be evaluated prior to mandating the use of fixed price contracts in early phases of the acquisition life cycle. If the DOD is able to strengthen cost estimation practices, then cost reimbursement type contracts may not be subject to steep overruns.

3. Do the Benefits of Requiring Approved Cost Accounting Systems Outweigh the Costs?

Typically, special accounting system and IT system need to be approved for TINA compliance. Firms may forego the opportunities of doing business with the government because they worry about the extra cost of setting up a government-unique infrastructure and disclosure of sensitive cost or pricing information. Additionally, long lead times for re-auditing corrected discrepancies and risk of new discrepancies discovered may limit future attempts for this business to comply with auditing standards because of lack of capital, and thus a disinterest to bid for large dollar cost-type contracts. If this disinterest occurs, the government may be limiting its competitive pool and thus providing room for unnecessary cost and/or price inflation. Obtaining cost data regarding accounting systems, length of time for approval, and surveying contractors who forego

bidding may indicate whether or not the costs of obtaining and maintaining an approved accounting system outweigh the benefits.

LIST OF REFERENCES

Caillaud, B., & Hermalin, B. (2000). *Hidden-information agency*. Berkeley, CA: The basics of contractual screening. Retrieved from http://faculty.haas.berkeley.edu/HERMALIN/mechread.pdf.

Choe, C., & Quinn, D. (2012). *The evolution of the contract type used in defense acquisition with a focus on major defense weapon systems.* Retrieved Oct 2014, from http://calhoun.nps.edu/bitstream/handle/10945/17445/12Sep_Quinn_Choe.pdf?sequence=1

Contract Attorneys Deskbook Volume 1. (2013). Truth In Negotiations Act (TINA)—Introduction. Contract Attorneys Course Deskbook. Retrieved from http://www.loc.gov/rr/frd/Military_Law/pdf/CAD-2013_V-1.pdf.

DCAA. (n.d). About DCAA. DCAA Contract Audit Manual, Chapter 9, Oct 2014. Retrieved from http://www.dcaa.mil/about_dcaa.html.

Defense Contract Audit Agency (2014). DCAA contract audit manual. Defense Contract Audit Agency. Retrieved 2014, from http://www.dcaa.mil/cam.html

DCAA. (2014). *DP Sustention on Reports issued since 10–01–2008.* Redacted Version.

Di Guiseppe, T. (2011). Understanding the Truth in Negotiations Act in Federal Procurement. TD Government Solutions, Inc. Retrieved from http://www.calu.edu/business-community/government-agency-coordination-office/files/Tina.pdf.

Federal Acquisition Regulation (FAR). (2014). Retrieved from http://farsite.hill.af.mil/vffara.htm.

Federal Acquisition Regulation. (2014). FAR 2.101--Definitions. Retrieved from http://farsite.hill.af.mil/reghtml/regs/far2afmcfars/fardfars/Far/02.htm?zoom_highlight= %22certified+cost%22.

Federal Acquisition Regulation (FAR). (2014). FAR 14.403–1—Recording of bids. Retrieved from http://farsite.hill.af.mil/vffara.htm.

Federal Acquisition Regulation (FAR). (2014). 15.4—Contract Pricing. Acquisition Central. Retrieved from http://www.acquisition.gov/far/current/html/Subpart%2015_4.html

Federal Acquisition Regulation (FAR). (2014). FAR 15.403—Obtaining Certified Cost or Pricing Data. Retrieved from http://farsite.hill.af.mil/vffara.htm.

Federal Acquisition Regulation (FAR). (2014). FAR 15.403–1(c*)(4)*-- Adequate price competition. A price is based on adequate price competition if--. Retrieved from http://farsite.hill.af.mil/vffara.htm.

Federal Acquisition Regulation (FAR). (2014). *FAR 16.202.1—*Firm-Fixed-Price Contracts-Description. Retrieved from http://farsite.hill.af.mil/vffara.htm.

Federal Acquisition Regulation. (2014). FAR Part 16.202–2 Firm-Fixed-Price Contracts—Application. Retrieved from http://farsite.hill.af.mil/vffara.htm.

Federal Acquisition Regulation. (2014). FAR Part 16.301–3 Cost-Reimbursement Contracts—Limitations. Retrieved from http://farsite.hill.af.mil/vffara.htm.

Federal Acquisition Regulation (FAR). (2014). FAR 16.306—Cost-Plus-Fixed-Fee Contracts. Retrieved from http://farsite.hill.af.mil/vffara.htm.

Fischetti, M. (2014). The complications of cost and pricing. Federal Times. Retrieved from http://www.federaltimes.com/article/20140826/BLG06/308260017/.

Government Accountability Office. (2009). *Extent of federal spending under cost-reimbursement contracts unclear and key controls not always used.* Washington DC: Government Accountability Office. Retrieved 2014, from http://www.gao.gov/new.items/d09921.pdf

Government Accountability Office. (2013). United States Government Accountability Office. Retrieved Sep 2014, from Report to Congressional Committees: http://www.gao.gov/assets/670/662184.pdf .

Laffont, J., & Tirole, J. (1993). *A theory of incentives in procurement and regulation.* Cambridge, MA*:* Massachusetts Institute of Technology.

Lee, D. A. (2003). Exceptions and waivers to the Truth in Negotiations Act. Retrieved from http://www.acq.osd.mil/dpap/policy/policyvault/2003–0013-DPAP.pdf.

Maddox, J. L. (2013) *TINA turns 50!* Contract Management; April 2013, Vol. 53 Issue 4, p20.

Murdock, W. (2012). Truth-in-Negotiations Act (TINA) and risks of defective pricing. REDSTONE Government Consulting. Retrieved from http://resources.ncmahq.org/chapters/charleston_sc/CFCM%20Study%20Program%20Library/DP%20Webinar%20Oct%202012%20pdf.pdf

Obama, B. (2009). Memorandum for the heads of executive departments and agencies: Government contracting. Retrieved from http://www.whitehouse.gov/the_press_office/Memorandum-for-the-Heads-of-Executive-Departments-and-Agencies-Subject-Government

O'Rourke, R., & Schwartz, M. (2014). *Multiyear Procurement (MYP) and block buy contracting in Defense Acquisition: Background and issues for Congress.* Congressional Research Service, Washington DC. Retrieved 2014, http://www.fas.org/sgp/crs/natsec/R41909.pdf.

PGI 215.402(1)—Contract Pricing. (2014). Retrieved from http://www.acq.osd.mil/dpap/dars/pgi/pgi_htm/PGI215_4.htm

Public Contracting Institute. (2014). Trending cost & pricing August 18: Truth in Negotiations Act-Part I-Defective Pricing-Hazards. Retrieved from (http://www.cvent.com/events/trending-cost-pricing-august-18-truth-in-negotiations-act-hazards-defenses-part-i-the-cost-estimatin/event-summary-ad2015e8105149f284817d272c693c14.aspx

Rendon, R. G. (2011). *Assessment of Army Contracting Command's contract management processes.* Monterey, CA: Author. Retrieved 2014, from http://www.dtic.mil/dtic/tr/fulltext/u2/a556157.pdf

Rendon, R. G., & Snider, K. F. (Eds).(2008). *Management of Defense Acquisition Projects.* Reston, VA: American Institute of Aeronautics and Astronautics.

Riemer, J. R. (1997). The Truth in Negotiations Act-What is fair and reasonable? Acquisition Legislation. Retrieved from http://www.dau.mil/pubscats/pubscats/pm/articles97/riemend.pdf.

Rogerson, William P. 1994. "Economic Incentives and the Defense Procurement Process." *Journal of Economic Perspectives, 8*(4): 65–90. Retrieved 2014, from https://www.aeaweb.org/articles.php?doi=10.1257/jep.8.4.65.

Snider, K. F.,& Rendon, R. G. (2008). Public procurement policy: Implications for theory and practice. *Journal of Public Procurement, 8*(3), 310–333.

Sygnetics, Inc., B-404535.5 (Office of the General Counsel Aug 25, 2011). Retrieved Oct 2014, from http://www.gao.gov/assets/400/392871.pdf

United States General Accounting Office (GAO). (2002). DOD needs better guidance on granting waivers for certified cost or pricing data. *Contract Management.* Retrieved from http://www.gao.gov/assets/240/234421.pdf

Wang, C., & San Miguel, J. G. (2013). Are cost-plus defense contracts (justifiably) out of favor? *Journal of Governmental & Nonprofit Accounting*, 2(1), 1–15.

Williams, W. T. (1970). The Truth-in-Negotiations Act: The need for both truth and fairness. *Villanova Law Review,* Volume 16, Issue 1, Article 6. Retrieved from http://digitalcommons.law.villanova.edu/vlr/vol16/iss1/6

THIS PAGE INTENTIONALLY LEFT BLANK

INITIAL DISTRIBUTION LIST

1.   Defense Technical Information Center
      Ft. Belvoir, Virginia

2.   Dudley Knox Library
      Naval Postgraduate School
      Monterey, California